

DECEMBER 17, 1942

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The IRON AGE



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DECEMBER 17, 1942

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This Week in . . .

THE IRON AGE

Editorial

The Hidden Hunger 41

Technical Articles

Core Sand Reclamation by the Thermal Method 43
Substitute for Lycopodium Parting 48
Special Automotive Machine Converted to War Work 49
How to Choose Electroplating Equipment 50
Heating Metal Parts by Induction 55
Detecting Surface Flaws 56
Welding Wrought Iron 60
New Equipment: Material Handling 62

Features

Assembly Line 72
Washington 76
West Coast 80
Fatigue Cracks 84
Dear Editor 86

News and Markets

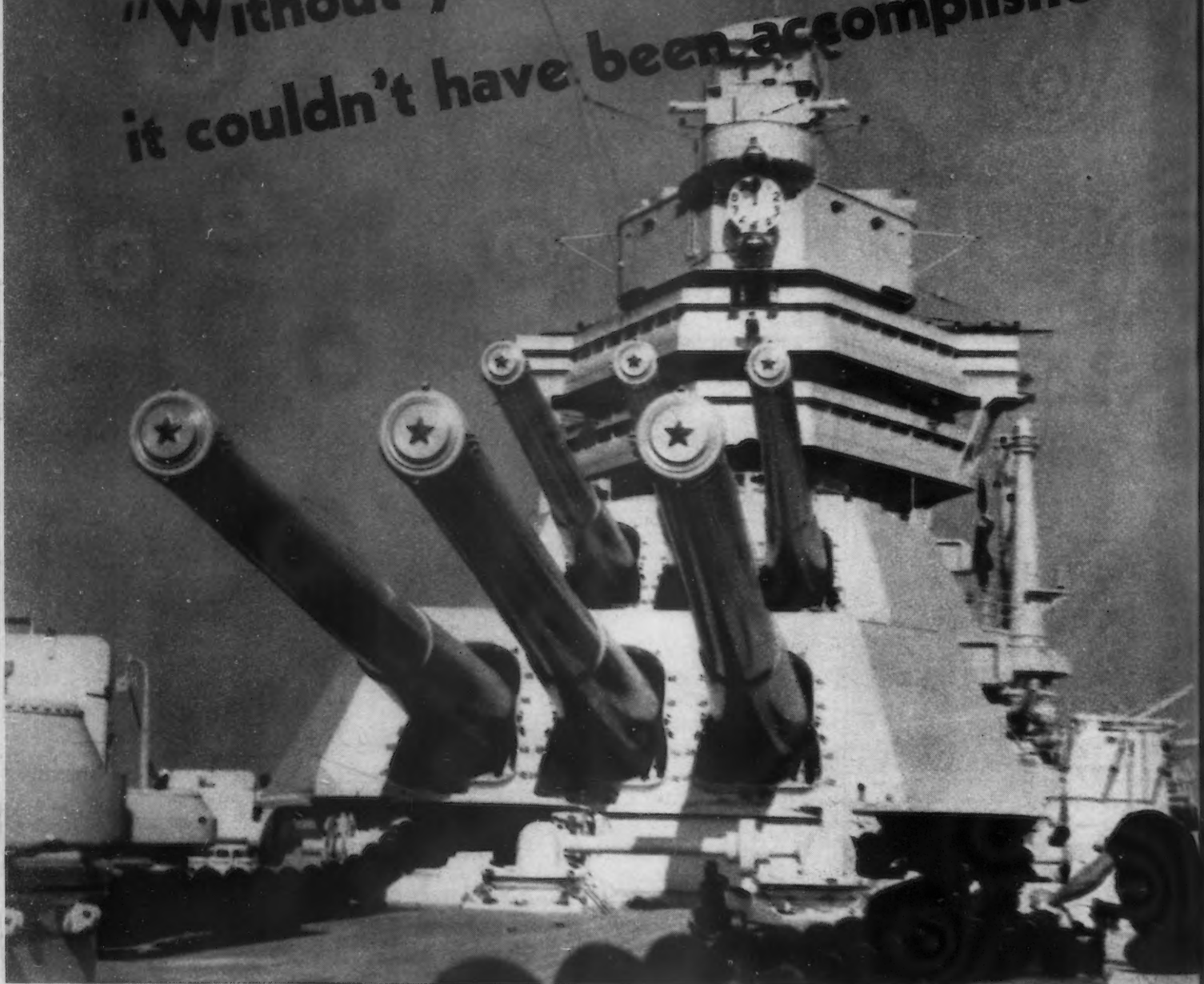
This Industrial Week 88
News of Industry 91
Personals and Obituaries 128
Machine Tool Activity 130
Non-Ferrous Metals 132
Scrap Markets 134
Iron and Steel Scrap Prices 136
Critical Machine Tools 137
Comparison of Prices 138
Finished Steel Prices 139
Warehouse Prices 142

Index to Advertisers 209

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it couldn't have been accomplished"**



OFFICIAL U. S. NAVY PHOTO

Record-breaking service on an important Navy order, made possible by Ryerson cooperation on steel! "Without your assistance, it could not have been accomplished," writes the contractor—and again Ryerson teamwork scores.

Cases like this—in which quick Ryerson steel-service has speeded up war production—run into the thousands! While we have not kept count, enough Ryerson customers are working on war contracts to firmly establish Ryerson steel from stock as a vital part of the war production machine.

Hundreds of plants on war contracts are depending on Ryerson for steel. An impor-

tant order here, too urgent to wait on mill production; a few bars there; some strip or a few sheets somewhere else. It multiplies into tremendous tonnage—all labeled "RUSH"—and it's all going into tanks, planes, guns and ships to beat the Axis!

It is a source of pride to the Ryerson organization that its One Hundredth Year finds it on the direct line of greatest service in the war production program—There is a great deal of satisfaction in a War Production Unit report: "Without your assistance it could not have been accomplished."

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THE IRON AGE

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DEC. 17, 1942

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ESTABLISHED 1855



The Hidden Hunger

LAST week I wrote about the need for preserving initiative even during the restrictions imposed on a national economy by war. For without initiative no wars can be won, nor no business made big from a small beginning:

If we are going to preserve initiative, both during and after the war, we must also take care of its twin brother, incentive. For incentive and initiative go hand in hand and it is hard to imagine the existence of one without the other.

During a war, the great incentive should be the universal desire of everyone to do his part to help his country win. Unfortunately, it does not seem to work out that way. The recent demands of the railroad unions are typical of the desire to make more money taking precedence over the desire to make more goods or services. However, this is not alone a symptom attributable to labor. Other sections of our society have not been free from this natural desire.

This hidden hunger for more can be and should be utilized as an incentive to better war production. But it should be discriminatory and not of horizontal application. People who do more should get more. Not people who merely do the same as they have been doing, or less.

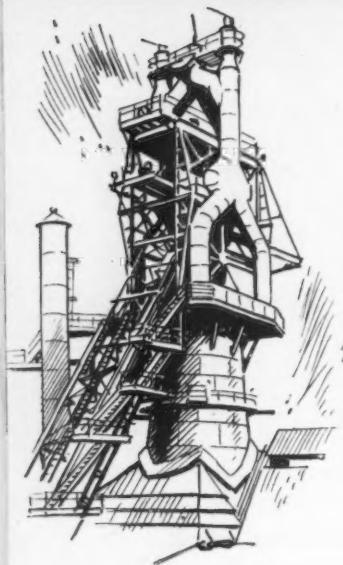
Unfortunately incentives for output have been frowned upon by labor leaders in general. Thus men and women who work are very largely paid for hours put in and not for quantity or quality of work put out. Artificial classifications set up to establish wage differentials have largely taken the place of individual incentives but they do not permit the suitable rewarding of exceptional talent. In fact, the system of union stewardship actually penalizes or prevents the exercise of unusual ability and workers have been forced out of work for doing too much.

Pay based on productivity would increase our war output by at least 30 per cent and diminish the cost of war production to the taxpayers by at least half that amount. Labor as a whole would get a much larger annual return in compensation than it now does, but it would be divided differently. Capable people would get a larger share of it than they now do and less capable not so much. But that very distinction, working upon the hidden hunger for more that is in all of us would be a powerful incentive for everybody to do better.

John Van Dusen



Dedicating Inland's newest blast furnace. Left to right, front row: J. H. Walsh, vice president; Mrs. Henry Straus, daughter of the late P. D. Block, an Inland founder; Wilfred Sykes, president; and, E. L. Ryerson, chairman of the board.



Inland Lights New Blast Furnace *First Constructed in Midwest Since Start of War*

Molten pig iron—1,200 tons a day—is now pouring from Inland's newest blast furnace. Long before Pearl Harbor, Inland realized the coming need for greater sustained production of pig iron and steel. Designs were made for a new blast furnace—construction was started late in 1941.

Today, despite handicaps of the labor and material shortages, this privately financed furnace has been completed in record time and is now producing pig iron.

This new furnace takes its place in the

war program, not only to augment production of pig iron, but also to safeguard Inland's needed iron supply in the event that other furnaces, long pressed to capacity, must be taken out of service for needed repairs.

Completion of this new blast furnace is the second major project undertaken and put into operation by Inland since war began. Other projects—including two additional blast furnaces for the Government—all planned to increase tonnage for America's war effort—are rapidly nearing completion.

*Dedicated
to Victory*

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Core Sand

Reclamation

.....by the thermal method

By W. A. PHAIR

Western District Editor, *The Iron Age*

RECLAMATION of used core sand by the thermal method is being accomplished on a production basis at the aluminum foundry of the Wright Aeronautical Corp.'s Ohio plant with highly successful results. This is the first successful production unit installed in this country for the reclamation of used core sand by the thermal method.

By contrast with the usual plant philosophy, in which used core sand is considered in the light of how much it costs to dispose of it as filling for city dumps, the success of the Wright reclamation unit has developed a highly important source of a vital and somewhat scarce raw material at a labor and fuel cost between 35c. and 40c. a ton, this cost being based on a fuel oil of 40,000 Btu. at $2\frac{1}{2}$ c. to 3c. a gal. Normally, about 10 to 11 gal. of fuel oil are required per ton of reclaimed sand.

The potential economies resting in the efficient handling and reclamation of core sand have been overlooked in many plants, due partly to the fact that too often the true cost of sand (including the disposal charge) is not fully realized and due also to the fact that a skepticism has existed with respect to the quality of such reclaimed sand.

Installations for the reclamation

... The first successful production unit for the reclamation of used core sand, by the thermal method, now in operation at a plant of the Wright Aeronautical Corp., is described in this article. Various processing steps and uses of such reclaimed sand are discussed in detail.

of used core sand by the dry and by the wet methods have been in operation for some time in several ferrous plants and have generally met with considerable success. For plants using wet shakeout, a wet reclamation method is logical, its efficiency being controlled by the type of core sand being worked and the binders used.

Carbon Removal Possible

Much of the prejudice shown toward reclamation efforts has been based on the belief that sufficient carbon could not be removed from the sand to make efficient reuse possible. While core sand can be used in many types of cores without complete removal of the film of carbonaceous material that covers the grains after the sand has been used, (resulting from the action of heat on the binders) the resultant core is usually rather brittle and requires the use of larger quantities of binding material. This latter

factor, aside from tending to lower permeability, also increases the cost of the core.

Experience at the Wright unit indicates that the thermal method of reclamation overcomes these objections and provides a reclaimed sand that can be used safely in place of new sand for all applications in the plant.

The term "core sand" when used in connection with the Wright reclamation activities has reference to dry sand mold for aluminum aircraft castings. The characteristics of this material are quite similar to the average internal core.

Summed up briefly, the Wright reclamation unit consists of equipment which crushes the cores, removes gagers, core rods, etc., then further granulates the core lumps, classifies them and passes them through a kiln where they are subjected to a heat treatment of 1400 to 1500 deg. F. This heat removes carbon and any organic material.

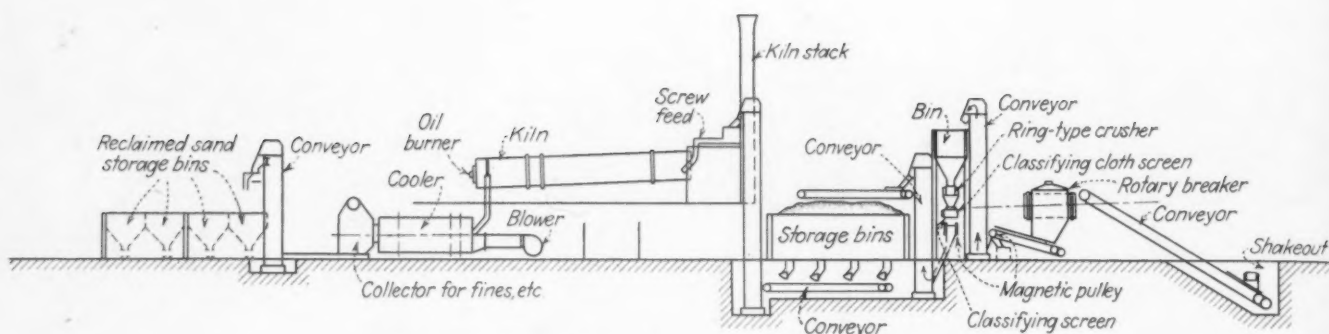


FIG. 1—Layout of used core sand reclaiming unit.

The burned sand is carried to a cooler and past a dust exhauster which further classifies the sand. The sand is then deposited in bins, ready for reuse.

Shortage Insurance

The Wright installation was developed through the combined efforts of the foundry engineers of Wright Aeronautical Corp. and the Link-Belt Co. of Chicago, with the latter company building and installing the unit.

The reasons for the installation of this equipment were several. The growth of aluminum foundry capacity was placing a severe drain on the sources of the particular

sand required for this type of work. Thus the ability to reclaim this sand was insurance against a possible shortage.

Another factor was the belief that reclamation could be made economically self-supporting. It was felt that the cost of reclaiming sand would be less than the cost of new sand delivered to the plant. Experience thus far has substantiated this belief. Still another factor was that this effort fitted in with the company-wide efforts to encourage conservation of raw materials. It was logical that after developing effective methods of reclaiming metal turnings, lubricating oil and cutting oils, attention should be di-

rected towards the reclamation of the next largest "waste" material, core sand.

A description of various methods of reclaiming core sand is given in "Modern Core Practices and Theories", published by the American Foundrymen's Association, Chicago, beginning on page 455.

The unit currently in operation at the Wright aluminum foundry was designed primarily as a pilot model. Experience gained from this installation, the first of its kind, will be used in the design of additional units to be erected in the company's new aluminum and magnesium foundries. In addition to these two units, a half-dozen or so additional installations are planned for other plants which also incorporate certain modifications based on the operation of this pilot plant. However, these changes will be largely a matter of refinement, for the principles of reclamation used in the Wright unit have proved practical and will still form the basis of these additional installations.

Processing Method

Fig. 1 is a rough plan view, not to scale, of the equipment and the sand flow of the Wright reclamation unit. It is drawn to show the method of processing, rather than the exact layout.

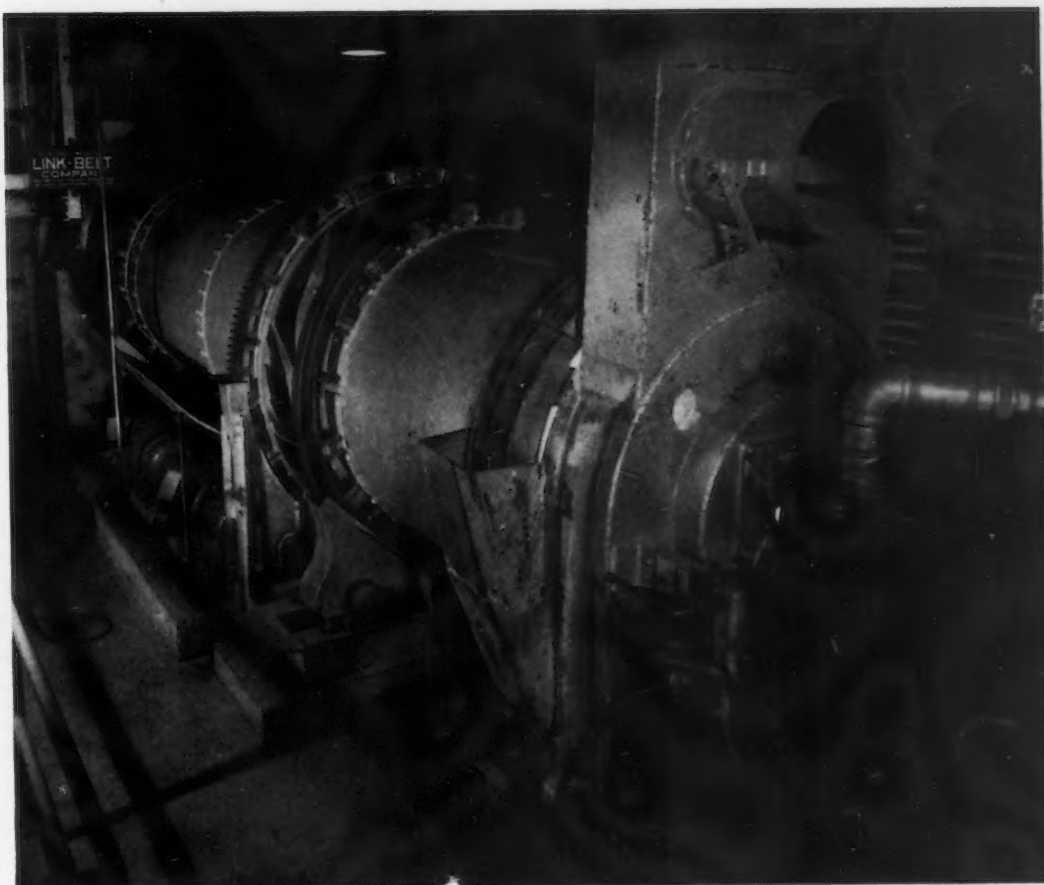
The molds are knocked out over an apron picking conveyor. As the broken molds move up this conveyor, laborers pick out chills, core rods, wires, etc., that were freed from the sand in the shakeout. This conveyor empties into a rotary breaker (Fig. 2) equipped with a screen with 1 in. holes. The tumbling action of this screen further reduces the size of the material to 1 in. or smaller and passes the lumps through to a conveyor underneath.

FIG. 2—First step in granulating cores is this breaker screen which passes lumps 1 in. and smaller. Core wires, etc., work out the end on the right.



BELOW
FIG. 3 — This magnetic pulley removes core rods, etc., which slip past the screen shown in Fig. 1.

RIGHT
FIG. 4 — View of the revolving kiln from the firing end, showing the oil burner. Sand enters the kiln at the far end and works down to the firing end.



Large lumps, some of which may be held together by core wires, etc., which cannot be broken down to the 1 in. size, and core rods, gaggers, etc., freed during the breaker treatment, work out through the far end of the screen, as shown in Fig. 2.

The lumps 1 in. and under, after leaving this screen, are carried over a magnetic pulley, which removes wires or nails remaining in the sand, and empties into a bucket elevator which raises the material to a bin. The type of material caught by this magnetic pulley is shown in Fig. 3.

From this bin, the sand passes through a ring crusher which further granulates it. The next step is a treatment by a classifying screen which passes pieces smaller than 30 mesh and throws off larger lumps into a separate bin from which they may be either discarded or recirculated through the system. This material is not being recirculated in the present Wright unit, but will be in succeeding installations.

The material passing through this screen is again run over a magnetic pulley which pulls out any iron oxides or small ferrous particles remaining in the sand and carries the sand into a large storage bin.

Shakeout operations in most foundries are an erratic procedure and rarely represent truly continuous operations. On the other hand, efficient and economical operation of a kiln in this type of reclamation unit requires that it be operated steadily and constantly 24 hr. a day. It is thus important that ample

storage capacity be available to assure an adequate, even flow to the kiln, regardless of the shakeout load. This is the purpose of the storage bin.

From this bin of 30 mesh particles, the sand is fed by screw conveyor into the kiln at a rate of $3\frac{1}{2}$ to 4 tons an hr. (new installations



under way will have greatly enlarged capacity).

This kiln, Fig. 4, is of standard design. It rotates at 1 to 3 r.p.m., depending upon the load, is oil fired, and is lined with wedge-shaped refractory brick. The slight inclination of the kiln, plus its revolving, serves to move the sand slowly from the entrance end to the discharge end where the oil burner is located.

As the sand progresses down the length of kiln in an oxidized atmosphere, its temperature is raised to between 1400 and 1500 deg. F. This temperature has been found adequate to burn off the carbon, while at the same time it is not so high as to cause fusion or cracking of the sand grains. Approximately 12 to 15 min. is required for the sand to pass from one end of the kiln to the other, with about 40 min. being required for a complete trip through the entire unit, or from the shakeout pit to the storage bins. The revolving of the kiln assures that every grain of sand is subjected to the heat. This treatment is the heart of the unit and it is here that the objectionable carbon and organic material are removed.

Cooling

From the kiln, the hot sand flows into a cooling unit. This machine

is a standard Link-Belt Roto-Louvre cooler, (Fig. 6), which has been found to do a very effective job of cooling in addition to permitting close control of the rate of cooling.

This operation was originally intended only to cool the sand but it has been found that secondary carbon removal takes place in this unit, further improving the quality of the sand. The sand is heated to between 1400 and 1500 deg. F. in

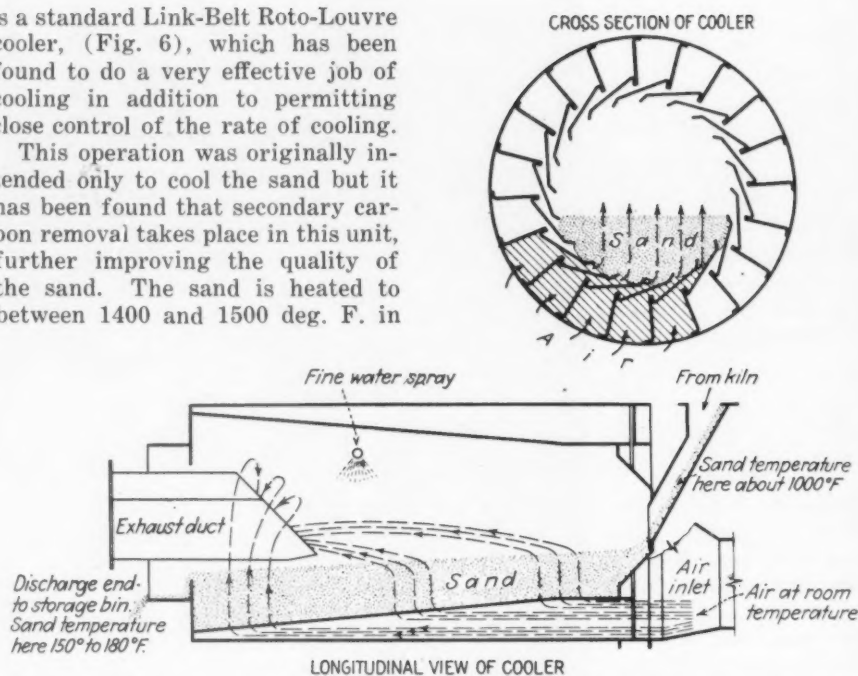


FIG. 5—Construction of cooling unit, where sand is brought down to a safe handling temperature.

the kiln, which brings the carbon on the sand to sufficient temperature for oxidizing with the excess oxygen available with the standard combustion ratio. It was found, however, that it was not possible to secure sufficient oxygen to oxidize

the sand completely and have the flame self-supporting. Therefore, when the sand, which is discharged into the cooler while still at the high temperature, comes in contact with air at room temperature, it immediately absorbs a large portion of the oxygen from the air, causing a so-called bleaching effect in the cooler.

Color is the most convenient empirical method of regulating the movement of the sand through the kiln and the cooler. The operator strives to obtain sand as white as possible from the discharge end of the cooler and adjusts the flow, by experience, to achieve this end.

The cooler is fed with about 10,500 cu. ft. of air per min. at room temperature. This air reaches the sand through the longitudinal sections in the cooler, visible in Fig. 5. The arrangement of the cooler is such that air is fed only into those channels that are directly under the load.

Toward the discharge end of the cooler, a very fine water spray hits the sand, serving to cool it further. The volume of this spray is regulated by a thermocouple mounted in the skin of the cooling drum so that the spray volume is directly related to the temperature of the sand. This prevents the sand from leaving the cooler wet and not free-flowing. When the sand enters the cooler, its temperature is about 1000 deg. F. and when it leaves it

FIG. 6—Exit end of cooler, showing duct which conveys reclaimed sand to storage bins. Sample in test can in this photo shows free flowing qualities of the sand after passing through the cooler.



is quite dry and easy flowing and is between 150 to 180 deg. F.

The discharge end of the cooler is also fitted with an exhausting unit which, in addition to removing the heated air, serves to classify the sand further. By controlling the velocity of this exhaust, the amount of fines removed from the sand can be closely governed.

Leaving the cooler, the reclaimed sand is carried to storage bins, ready for reintroduction into the core-making line. The fines are carried to another bin for disposal. Some new units will be equipped with arrangements for reintroducing as much of these fines back into the sand as is necessary to meet specifications.

When the new high production units are in operation, this reclaimed sand will be used at the Wright foundries for all purposes for which the new sand is normally employed. This will necessitate changing the screens on the core blowing machine. For the present, reclaimed sand is not available in sufficient volume to allow this change.

Mixture Proportions

Backing sand is made from 100 per cent reclaimed material, while in facing, reclaimed sand is used in the same proportions as new sand, except that about 1 per cent more cereal binder is required.

A typical backing mixture used at Wright's is made up as follows:

- 1200 lb. reclaimed sand
- 7.2 lb. Mogul binder
- 1 pt. NH_4NO_3
- 4.3 pt. Hyten No. 4 core oil
- 6 per cent moisture

In an emergency it has been found possible to use unburned reclaimed sand for backing, that is, sand that has not passed through the kiln. A typical backing using unburned reclaim would be as follows:

- 600 lb. unburned reclaimed sand
- 600 lb. Wedron No. 45 sand
- 7.2 lb. Mogul binder
- 1 pt. NH_4NO_3
- 6 pt. Hyten No. 4 core oil
- 6 per cent moisture

When unburned reclaimed sand, is used, the cores have a tendency to brittleness and the grains appear to lack cohesion. In some cases it is necessary to dilute such sand substantially to minimize this characteristic. It has also been found necessary, when using unburned reclaimed sand, to use large quantities of binders. This reduces per-

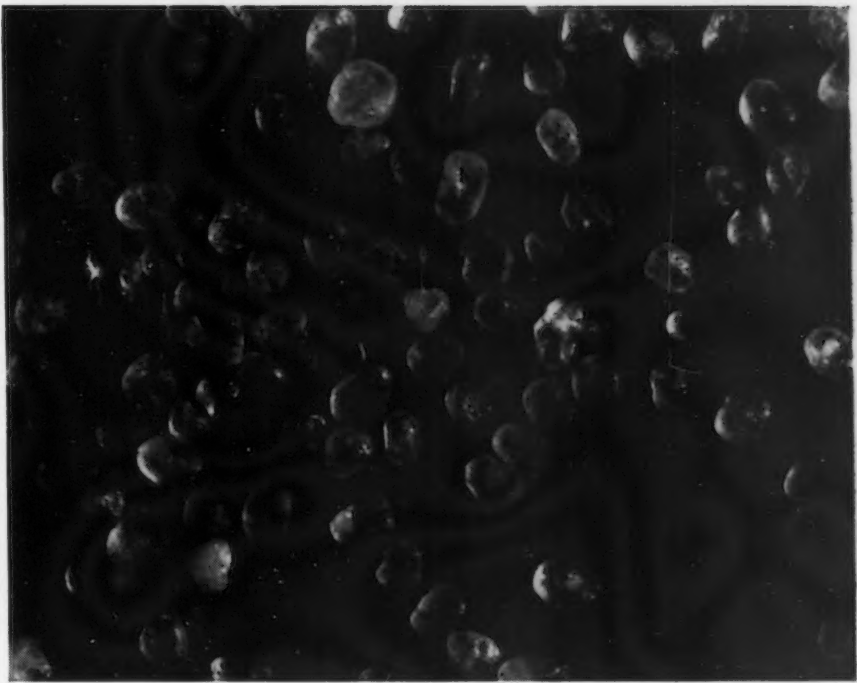
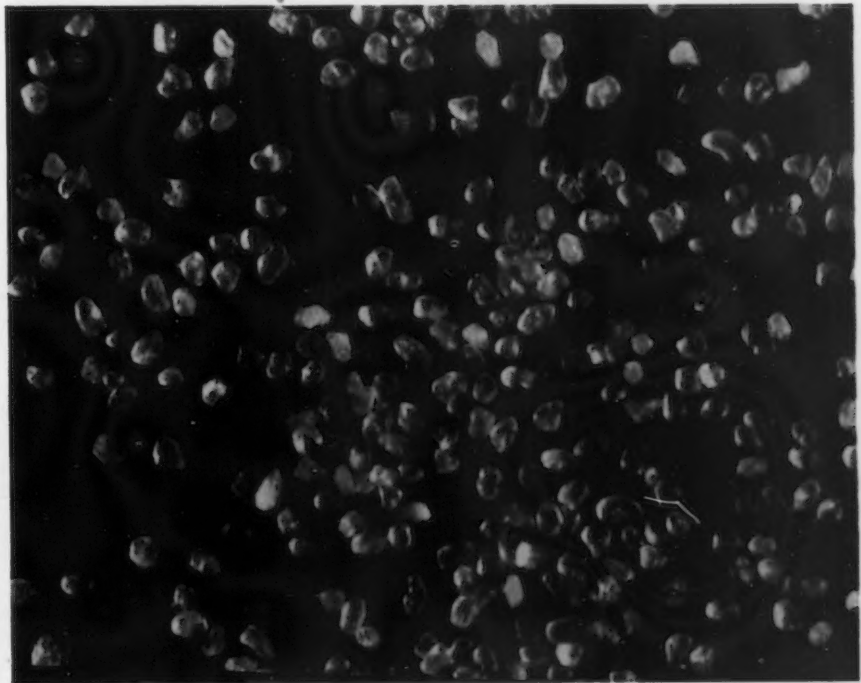


FIG. 7—Micrographs of reclaimed core sand taken from various classifying screens. Top specimen is from a No. 40 screen; bottom sample is from a No. 70 screen.



meability and raises the mix cost.

The analysis of the sand coming from the reclamation unit is determined largely by the type of sand going in. In other words, when molds having relatively little facing sand but a large proportion of backing sand go into the system, the analysis will differ from that of the sand from molds in which large amounts of backing sand are circu-

lated. Hence, there is a maximum variation of 10 per cent in the analysis of the reclaimed sand from day to day, but this variation is not large enough to require alteration of mix proportions.

A comparison of screen analysis of various types of new and reclaimed sand is given in Table I, while Table II gives a comparison of physical properties of typical

mixes used at Wright. Screen analyses are made every shift at Wright, or more frequently if warranted.

The amount of carbon remaining in this sand after passing through the unit is about 0.5 per cent, according to ignition tests. The microphotographs, Fig. 7, show how thoroughly cleaned the reclaimed sand is. If these photographs are studied closely, it is possible to differentiate between the Wedron round grains and the angular Penn Glass grains.

With recirculation, it is possible to reclaim about 85 per cent of the sand going into the unit. Some loss is unavoidable in the form of fines and dust, and there is also a loss in conveying the sand through the various stages of the process. A small amount of sand also remains adhered to the core rods and wire. There appears to be no limitation on the number of times a sand may be put through the reclamation system, provided that the temperature of the kiln is not permitted to reach the point where cracking or fusion takes place. Weak grains may be broken down to fines after a time, but this is the only direct loss of grains in the system.

As it stands now, all the sand reclaimed at the Wright foundry finds use; as a matter of record, foundry officials assert that they could use larger amounts if it were available.

The economics of a reclamation unit are largely determined by the location of the plant with respect to the sand source. Thus a plant located some distance from the sand source and consequently having a heavy freight rate, would experience a higher saving from such

TABLE I
Comparative Sand Analysis
(AFA Standards)

	Reclaimed Sand		New Facing Sand	Core Blowing Sand
	Sample A	Sample B		
	Per Cent Retained			
Sieve No. 6	0	0	0	0
12	0	0	0	0
20	0	0	0	0
30	0	0	0	0
40	0.62	0.52	0.30	1.16
50	10.42	8.28	4.50	14.90
70	30.70	27.36	12.36	36.12
100	34.02	33.36	27.60	29.44
140	15.48	17.40	25.92	12.76
200	6.00	7.98	18.00	4.50
Through 200	2.58	4.84	11.50	1.26
Total	99.82	99.74	100.18	100.14
% Fines	8.58	12.82	29.50	5.76
Grain Fineness No.	78.85	81.17	107.26	67.19

TABLE II
Comparative Physical Properties
(AFA Standards)

	Backing Sand (100% Reclaim)	Backing Sand (100% Wedron No. 45)	Facing Sand (50% Penn Glass) (50% Wedron No. 60)	Facing Sand (50% Reclaim) (50% Penn Glass)
Tensile, lb. per sq. in.	165	178	124	112
Transverse (baked), lb. per sq. in.	35	36	28	25
Hardness (baked)	78	86	82	85
Green Permeability	88	73	31	36
Dry Permeability	131	120	52	54
Green Compression	1.0	0.95	1.6	1.1
Moisture, per cent	6	6	7.2	6.5

Note: Above data are taken from samples from individual batches. They are typical, but are not averages.

reclamation efforts than would a plant located near its sand source.

The fact that this system also acts to assure a supply of the

proper type of sand in these days of scarcity is also an important factor, but one not directly measurable in dollars and cents.

Substitute for Lycopodium Parting

DEVELOPMENT of a substitute for lycopodium parting for foundry use has been announced by Delta Oil Products Co., Milwaukee. Lycopodium was previously obtained from Poland and Russia, but the war shut off these sources. The new substitute developed by Delta is called "Partex" and is made by pulverizing hard, clean English walnut shells in such a manner as to produce a dry, or-

ganic, powder that dusts freely. It is chemically treated to have approximately the same waterproofing characteristics on the surface of pattern and core boxes as lycopodium. Its structure, under the microscope is reported to be very similar to lycopodium.

Partex is said to be non-reactive with molten metals, is free dusting and has uniform surface affinity for

sand which eliminates building up in core boxes and patterns. No special equipment is required to use this material and it is said to eliminate the silicosis hazard present with certain other types of parting compound. Field reports indicate that it serves as a very efficient replacement for lycopodium. Its cost is said to be substantially less than lycopodium.

Special Automotive Production Machine Converted to War Work

WHEN contracts for the fabrication of sub-assemblies of a certain type of heavy gun mount parts were awarded to the Midland Steel Products Co., Cleveland, the plant was faced with either a long wait for expensive machine tools necessary to start work on the contracts or retooling equipment on hand. To purchase new equipment for one part of the job would have required machinery costing many thousands of dollars, and the delivery of such equipment could not have been made for several months.

Since much of the equipment at Midland, like other plants, was installed for special purposes, retooling of existing machine tool equipment was the only means by which production could be started immediately. While fill-in machine tool equipment, material handling equipment and stress relieving equipment had to be installed, the speed and ingenuity in converting existing equipment and actually starting production was considerable. The net result is that the company not only went into production weeks ahead of time, but today is well ahead of schedule and is increasing its output weekly.

One particular operation in which existing equipment was adapted to the war job was the drilling of outrigger parts used in the sub-assembly. The machines now in use in the drilling operations were especially designed and formerly used in the fabrication of rear axle housings and front end assemblies for automobiles. These machines had not been used since the curtailment of automobile production and were stored in the company's inventory of surplus equipment. In order to use this machinery, the gun mount sub-assembly was redesigned by the Army with the aid of Midland engineers. This redesign greatly simplified the part so that the machinery on hand could be used to do the job. Simplification of design of the part in no way decreases its use or serviceability, but instead permits easier and quicker fabrication as well as facilitates repair and maintenance.

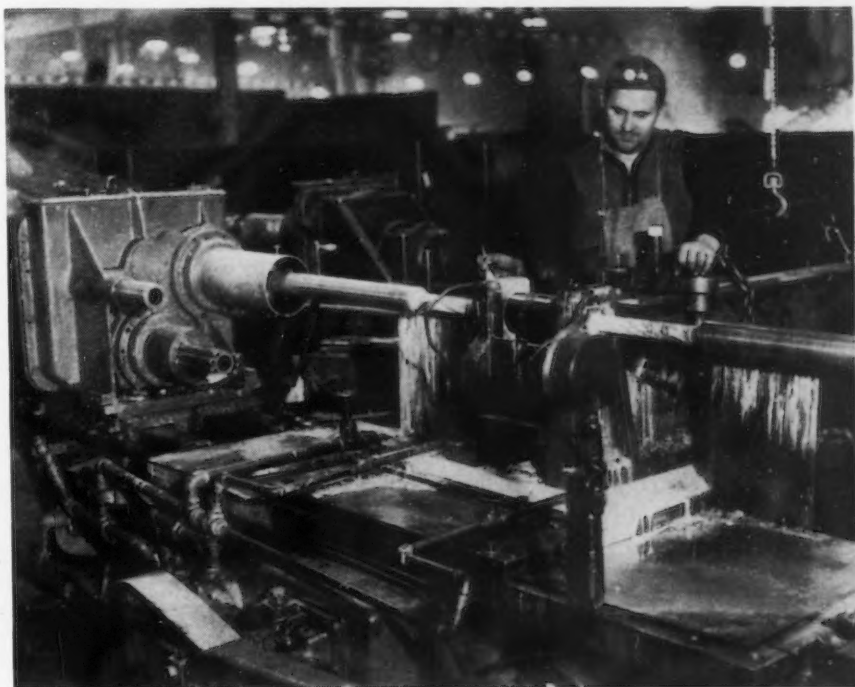
Formerly Machined Axles

The machines used to drill 1½ in. hinge pin holes in the end of the gun mount part sub-assemblies are

of two designs. One of the machines originally was constructed to bore and ream rear axle housings. Three spindles operated on the housing simultaneously. In drilling the gun mount parts, only one of the three spindles is used, the other two having been dismantled. The part is held in place by a specially designed jig so that the drilling and counterboring opera-

on the gun mount sub-assembly.

These machines, of which there are several in use, can handle upwards of 15 parts an hour, a good production rate on machines of even the latest design. This particular job is only one of the wartime processes which have been installed at Midland in turning the plant entirely from peacetime products to wartime production.



THIS machine, formerly used in the manufacture of rear axle housings for automobiles, was one of the surplus pieces of equipment utilized by Midland Steel Products Co. on war contracts. The two spindles that were dismantled for this job can be seen, as well as the special fixture for holding the part.

o o o

tions are performed on it simultaneously from either end of the machine.

The other machine had a double spindle head on one end and a single spindle head on the other and was used in finishing the front end assemblies of automobile frames, the work being done on three faces. In the new set-up, one of the spindles is left idle. The other spindle was already in line with the spindle or the other sliding head of the machine. With the special boring fixture, illustrated, to hold the part in place, this equipment is being used to drill and ream a hinge pin hole

Layouts for new assembly lines were developed and installed; conveyors from the refrigerator lines, one of Midland's peace-time products, had been piled up in the storage yard and were brought back in service and utilized in moving heavy parts; and training of personnel to handle war production was accomplished quickly and efficiently. In the single job of assembling the gun mount parts, 12 machine tools have been adapted to this special purpose or are rebuilt units taken from the company's inventory of obsolete and surplus equipment.

How to Choose Electro

ELECTROPLATING is now something over 100 years old. It has grown during the last 25 years faster than in all the previous years of its existence. It has grown not only in volume of output but in accuracy, precision of operation and quality of product. During this quarter-century it has changed from an art to a science. To be sure the fundamentals of electroplating are not yet fully known (perhaps they never will be) but electroplating can now be carried on under planned conditions and with controlled operations. In other words, electroplating can be done in such fashion as to achieve a predetermined end.

Without question a large part (how much is impossible to say) of this advance may be credited to the chemist, the research worker, the academic man in the industry. Without him, electroplating would still be a rule-of-thumb, guess-work process. And it may be said that the researcher and the theorist have received full credit for their achievements through the literature on electroplating which has grown to large proportions. The industry

is fully aware of its debt to the technical and scientific worker.

But electroplating as an industry rests on more than chemistry, metallurgy, physics and electricity. Indispensable as these sciences are, electroplating (or for that matter, any other process of manufacture) would be helpless without the other support which has helped to raise the industry to its present high place—machinery and equipment.

Indispensable to the growth of electroplating operations as a practical manufacturing operation, electroplating equipment has also been responsible for some of its longest strides forward. An outstanding example that illustrates this fact is the low-voltage direct current generator, and what it has done for the industry as compared with the battery.

Strangely enough, the literature of electroplating has devoted only a minor part of its space to equipment. Libraries have been collected on the chemistry and metallurgy of electroplating; but comparatively little on its mechanical aspect—the equipment.

For that reason, it is the purpose

of this series of articles to describe this phase of the industry. The articles will be divided into groups based upon the type of work handled and the operations performed, as follows (listing them in order of operations as performed on metal products):

Equipment for preparing the metal for a plate: Grinding, polishing, sand blasting, tumbling, degreasing, etc.

Current suppliers and accessory instruments: Generators, rectifiers, rheostats, ammeters, voltmeters and ampere-hour meters.

Tanks and containers

Plating barrels

Dipping baskets

Conveyors — semi-automatic and full automatic

Dryers

Equipment for final finishing: Polishing, buffing and burnishing.

Each one of these groups will be discussed in the following fashion:

- (1) General principles involved
- (2) Construction
- (3) Types available

All of these discussions will be written from the point of view of the user, to solve his problems and to answer the questions which the manufacturer of metal products (and for that matter any products) must ask.

(1) What types of equipment and material are available for my work?

(2) What will they do for me?

These articles will not be published in the order given above, but rather in the light of present day, war-time needs. For that reason, the first of this series will be devoted to plating barrels, which occupy such an important place in the mass production of small parts for munitions and other war products.

Electroplating Barrels

When small articles are to be plated, the problem of making the necessary electrical contact presents difficulties. Often the work is so small that the labor of wiring or racking the pieces would be unduly great. Sometimes they are of such



(Courtesy U. S. Galvanizing & Plating Equipment Corp.)

Single cylinder horizontal unit showing anodes in place.

plating Equipment

By ADOLPH BREGMAN
Consulting Engineer, New York

a shape—spherical, for instance—that wiring is impossible. In such cases, the rotating plating barrel is the answer.

The plating barrel is an apparatus for depositing a metallic coating on small articles in large quantities. It consists essentially of a revolving barrel-shaped container for the work, so constructed that the current flows from the positive bus bars to the anodes, through the solution, to the work and out through the negative contacts, through the trunnions of the barrel to the negative bus bars; the load meanwhile being immersed in the solution and kept in the current circuit as a result of the work always touching some of the various types of contacts with which the plating barrels are provided, to make connections to the negative bus bars.

Plating barrels are of two main types: First the horizontal barrel with closed ends and perforated sides or panels, which is suspended in a tank that holds the solution; and second, the oblique or tilted barrel with solid or perforated walls and open top. Both types have their advantages and disadvantages; they are made up in various materials and in a number of different forms.

The choice of which type of barrel to use—the horizontal perforated barrel or the open end tilted type—will be governed by the size and shape of the articles to be plated and the size of the load. Perforations in the horizontal, tilting or oblique barrel may be as small as 1/64 in. slotted or 1/32 in. round. In general, the oblique units are used for "utility work"—plating loads of 1/2 lb. to 10 lb. which of course would be too small a load to plate economically in the horizontal cylinders. However, larger capacity units are available up to 25 lb. and even higher, as described later in this article.

Specific examples will illustrate the questions involved. To plate a load of 30 lb. to 150 lb. of screws, bolts, castings or stampings 3 in. to

... Electroplating equipment has been a vital factor in the development of the metal finishing industry. This first article of a series analyzes high production machines, such as plating barrels, which are indispensable in the finishing of war products.

7 in. long, the horizontal barrel is used. To plate a load of 10 lb. to 100 lb. of tacks, screws, buttons, buckles, etc., 1/2 in. to 3 in., an oblique perforated wall barrel could be used, if of proper size; or, if nearer 100 lb. than 10 lb., the horizontal barrel. For 1/2 lb. to 10 lb. of small tacks, screws, buttons, etc., the oblique solid wall barrel is best.

Many shops will find use for all types of barrels. The tilted form, essential for very small articles, can of course, be used with those of slightly larger size, but its plating efficiency is lower, its ratio of anode to cathode surface is low; hence it may not be economically feasible. Articles of larger size, or of considerable weight should not be handled in any barrel, because of some danger of breakage of the barrel;

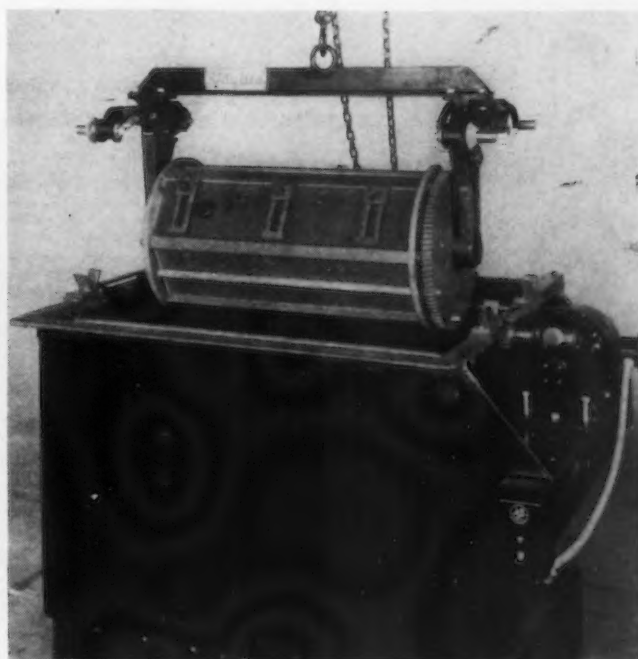
and mainly, loss of production by defective plating, work marred by abrasion of heavy pieces.

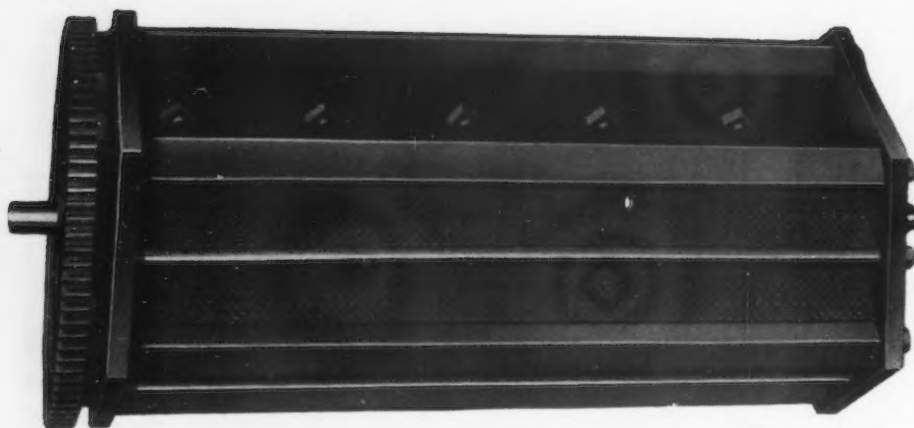
Horizontal Barrels

The horizontal barrel consists of a cylindrical or hexagonal (or in some cases octagonal) hollow barrel, closed at both ends, but with a removable panel to allow charging and discharging of work, revolving in a tank filled with a solution of the proper electrolyte. The barrel is made with solid ends and perforated side walls, the round perforations varying in size from 1/16 in. up to 1/2 in. in diameter; or the grid type may have horizontal slots between rectangular or circular rod type staves. Interesting variations are shown, however, in two additional types of cylinders that are

SINGLE - CYLINDER unit, motor driven.

(Courtesy The Udylite Co.)





manufactured for large or particularly heavy types of work, and which are said to be better adapted than the standard panel type cylinder. One is the laminated cylinder where the frame of the barrel is molded and the sections stacked one on top of the other to form a cylinder. The other is a rod type cylinder which is designed especially for heavy, rough cast parts. Both of these cylinders allow an unusual circulation of solution through them.

Simple as the machine seems, in principle, the proper design and construction of a plating barrel is no elementary matter. Ever since the first barrel was built (with canvas panels) and later with wicker, celluloid, rubber covered steel and other types, the plating barrel has been one of the most "tricky" machines to build, principally because it had to be simple, and because it

ABOVE
Plating barrel cylinder; with molded-in copper conductors, showing contact buttons set on Bakelite blocks.

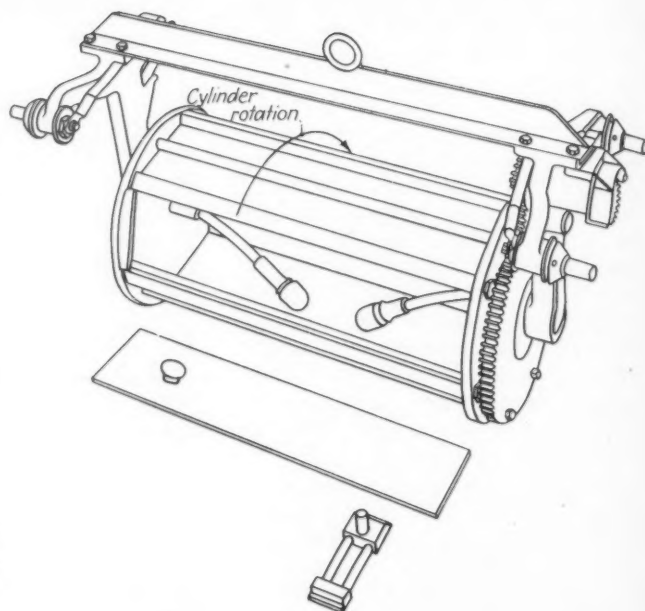
(Courtesy Hanson-Van Winkle-Manning Co.)

RIGHT
Rod type cylinder for heavy work.

(Courtesy Crown Rheostat Supply Co.)

BELOW
Cylinder and superstructure assembly; dangle contact.

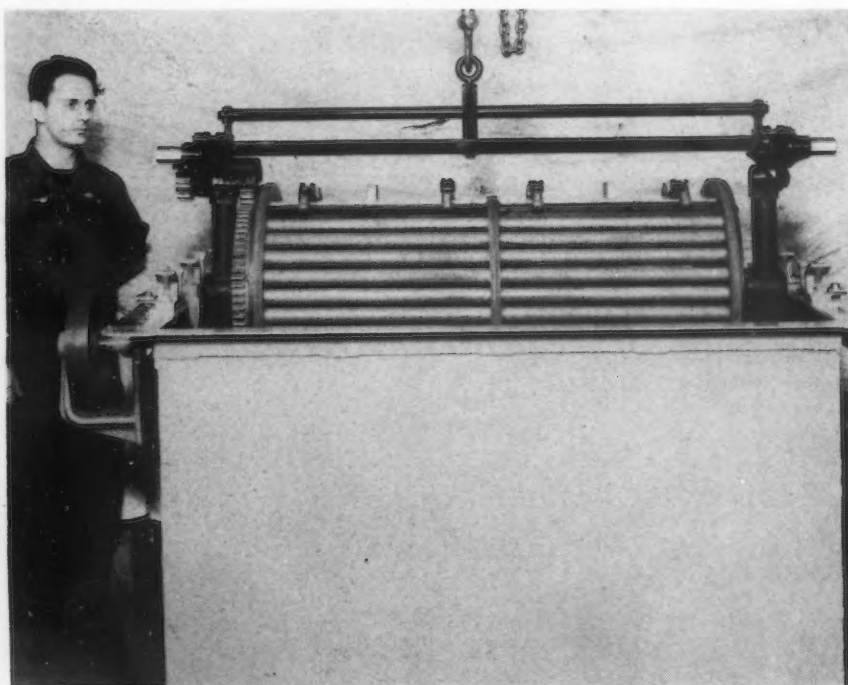
(Courtesy Udylite Co.)



is faced with a peculiar combination of chemical, electrical and mechanical conditions.

It is always important to use the largest permissible sized perforations to increase the current carrying capacity of the unit. The best speed of rotation, the obvious need for efficient contacts, the advantages and disadvantages of straight, curved and U-shaped anodes used in this equipment all have to be taken into consideration.

The development of present-day plating barrel design is the result of practical conditions and mate-



rials available, as well as engineering calculation.¹ For example, the

¹ A. P. Munning, Munning & Munning, Inc., Newark, N. J. Private communication.

heads of the original plating barrel cylinders were made out of cypress and oak which were found to be lacking in durability, necessitating the conversion of equipment to mahogany. The widest mahogany boards available were normally 14 in. and these heads could be cut from them most economically. Particularly, this figure was found to be both a critical and a satisfactory dimension. The wider the head of a plating barrel, the further away from the anode are the pieces that are lying midway in the barrel, and since the anodes must be still further away from the outside of the cylinder, to prevent burning of the work nearest to them, the 14-in. diameter head was of favorable size.

Further, since the surface area of the work in the plating barrel cylinder viewed from the cross-section is that representing the parts lying along the chord and the segment, the relationship of distance to load varies least from a practical standpoint, with the use of a 14-in. diameter cylinder. For instance, assuming that the load were doubled in a cylinder so that the height measured from the center of the chord to the center of the segment were doubled, the surface area would be increased approximately $1\frac{1}{2}$ times (the length of the cylinder being the same) and if in addition, the length of the cylinder were doubled, the surface area would be approximately tripled.

In considering the lengthening of a plating barrel cylinder, it is

Fifty-fourth in a Series of Articles on the Technical and Economic Aspects of Metal Cleaning and Finishing

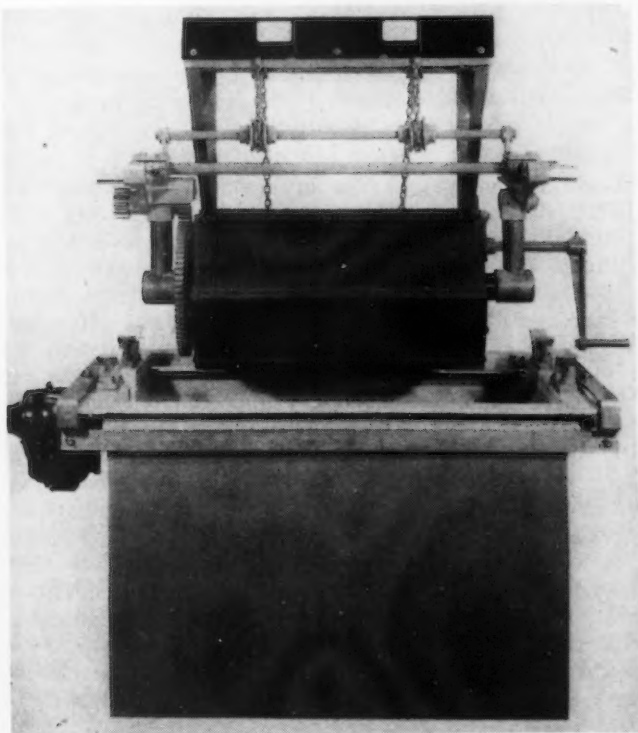
also of extreme importance in preventing a cylinder from twisting which would be more destructive to its construction than any other factor. Since plating barrels must be built with as few retaining metal parts as possible, the rigidity of the cylinder depends upon correct design and construction as well as the materials from which it is fabricated. The deflection of a cylinder, due to excess loads, will also be found to be a function of length.

The barrels today are generally constructed of Bakelite, hard rub-

ber or special composition. Which material is best for all purposes or for any specific purpose, is still the subject of much discussion. Rubber or Bakelite will be satisfactory for acid solutions—nickel, acid zinc, acid copper, etc. For alkaline solutions at room temperature, with low caustic content, rubber, special composition and Bakelite serve well. For alkaline solutions operated up to 150 deg., hard rubber or special composition rubber is recommended for cylinders of moderate sizes. In cylinders of large diameter, there may be a tendency of the rubber to warp and become distorted, which would be highly objectionable. One prominent manufacturer states that while rubber can be used for almost anything, Bakelite is less suitable for caustic solutions.

The mechanical features of the plating barrel, the drive mechanism, handling equipment, etc., are so designed as to use standard parts and accessories, motors, gears, speed reducers, etc. Representative examples and their details are shown in the accompanying illustrations.

Sizes range from the small lot or jeweler's barrel, up to the large capacity size, 20 in. in diameter and up to 42 in. long. Large production installations are made up of mul-



LEFT
LAMINATED cylinder with molded cross section stacked together to form the cylinder.

(Courtesy Crown Rheostat & Supply Co.)

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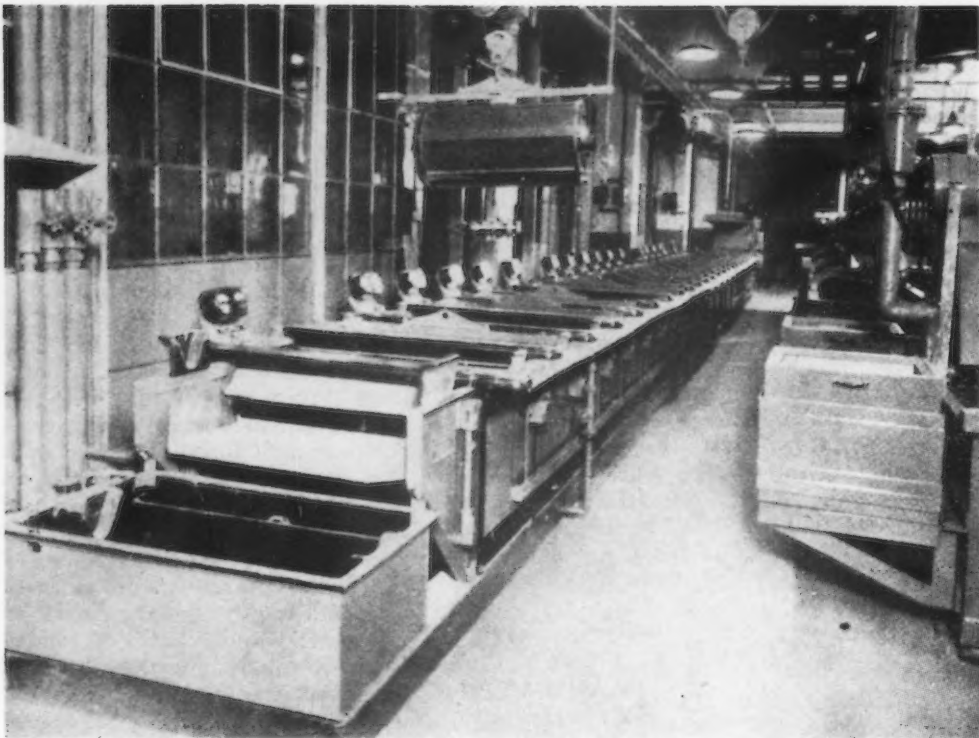
BELOW
SINGLE cylinder unit operated without overhead structure.

(Courtesy The Lustre Co.)

necessary to use the flexure formula which includes moment of inertia, section modulus, and stress for transverse loads. Increasing the length of the barrel, with a corresponding increase in load will cause a corresponding increase in the moment and stress, and the loading causes the stress to be squared. Tripling the length of the barrel which would automatically accommodate three times the load will increase the stress nine times when the barrel is set in motion. Torque is involved and the stress is directly proportional to the torque applied.

The consideration of torque is





LEFT
BARREL installation of 21 units for nickel, zinc, brass, copper, tin and cadmium.

(Courtesy U. S. Galvanizing & Plating Equipment Corp.)

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BELOW
FIVE-CYLINDER unit, individual motor drive.

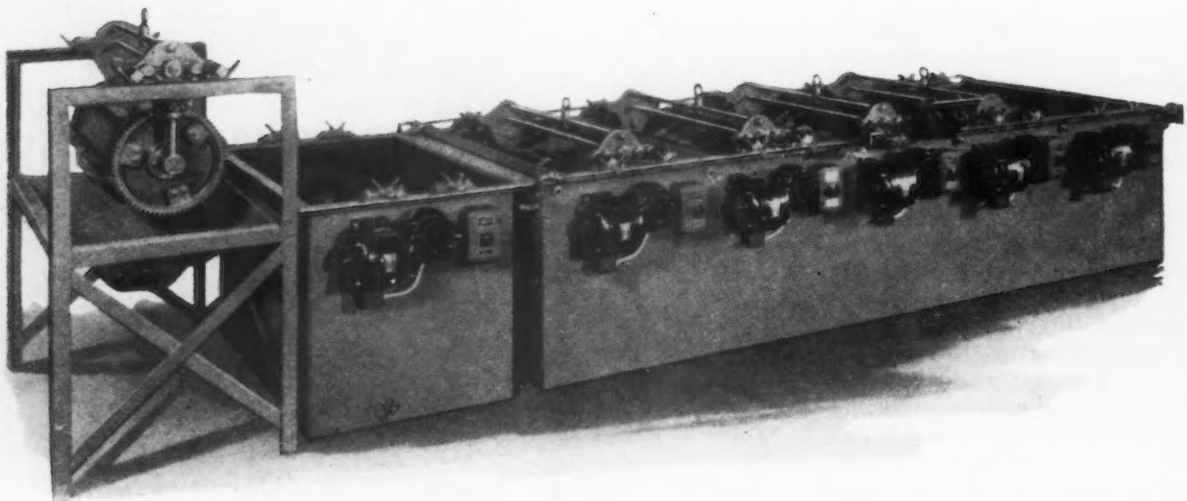
(Courtesy Munning & Munning, Inc.)

tiple-barrel units in parallel, with over head trolley hoist and with hoppers for handling the cylinders and the work. The barrel in most general use is 12 in. to 14 in. across the head by 30 in. to 36 in. long, and will hold from 50 to 150 lb. of work to be plated, depending upon the size and shape of the articles. From a practical standpoint it may be calculated that the maximum load for the horizontal barrel will fill 40 to 60 per cent of the cubic contents depending upon the type of contact used; the minimum economical load, 25 to 30 per cent.

A popular barrel has the current led out from the work and contacts through molded or recessed copper conductors in the ribs and live head.

For heavy duty work, cylinders may be made with a capacity of up to 250 amp. per rib. Actually, however, the current is limited by the electrical capacity of the hub in the center of the spider in the head of the barrel, and few barrels carry more than 300 to 400 amp. although some installations for plating bright zinc are using from 600 to 700 amp. Standard Bakelite cylinders have $\frac{1}{4} \times \frac{1}{2}$ in. copper conductors in the ribs, and the live head has a $\frac{1}{8} \times 1$ in. copper star or spider conductor. It is through these means that the current is carried through the head, from the ribs, from the button contacts which are screwed into these ribs on the inside of the cylinder.

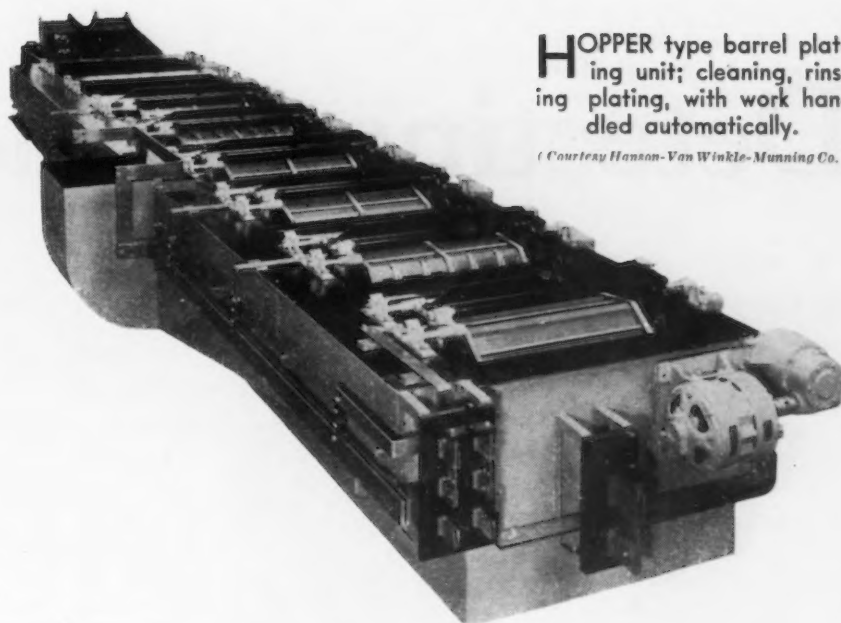
The current passes through six ribs on a 14 in. barrel and eight ribs on a 20 in. barrel. On a 14 in. barrel, when the solution is low, there are really only three ribs in the solution at one time. However, in a number of installations, the barrel is completely submerged. In one heavy duty barrel, the rib inserts are $\frac{1}{2} \times \frac{1}{2}$ in. copper conductors and the head inserts are $\frac{1}{4} \times 1$ in. The large sizes are necessitated by the fact that the conductors are covered and would heat, expand and break the staves if 250 amp. were carried through a smaller conductor. With exposed conductors, a smaller cross-section would be sufficient to carry 250 amp. In the rubber cylinders, the rib insert is



$\frac{5}{8}$ in. square bronze and the head insert is $\frac{1}{4} \times 1$ in. bronze.

Another factor which determines the current-carrying capacity of the barrel is, of course, the character of the work. Heavy work with a low proportion of surface to mass will have a low current-carrying capacity, due to the lack of surface contact between the pieces. Conversely, light pieces with relatively large surfaces will have a high current capacity. In addition, the concentration of solution used, the temperature and the conductivity of the solution will affect the current capacity of the barrel, since some baths are more conductive than others. Other important factors are the depth to which the cylinders are immersed in the solution, the average anode-to-cylinder distance and the area of anode surface in the tank.

The horizontal barrel is primarily a high production machine, capable of taking substantial quantities of work, at a current density which will turn it out in a minimum of time. In addition, it provides more



HOPPER type barrel plating unit; cleaning, rinsing plating, with work handled automatically.

(Courtesy Hanson-Van Winkle-Munning Co.)

even current distribution than the small oblique, solid-wall or "utility" barrel, by reason of its ability to expose larger surface areas of the work to the solution, and therefore

in general, turns out a more uniformly plated product.

Ed. Note:—Next week the author concludes his analysis of plating barrels by examining oblique barrels, contacts, anodes, etc.

Heating Metal Parts by Induction

THE heating of parts to temperatures of about 500 deg. F. to facilitate the insertion of freeze-fit parts and for other similar operations is now being accomplished in from 1 to 3 min. on various sized parts by means of induction heating. Several typical applications of this process are described by the American Car & Foundry Co., New York, whose a.c.f. Berwick electric transformer heaters are used.

One of the smaller applications consisted of heating Nitalloy bushings, measuring $3\frac{7}{8}$ in. o.d. with $\frac{1}{4}$ in. wall thickness and a length of $3\frac{5}{8}$ in., to between 400 and 500 deg. F. This was accomplished by an induction heating in 1 min. 15 sec. with a demand of 25 kva. With a demand of 32 kva. the time was reduced to 1 min. 5 sec. Two bushings were also heated simultaneously in 1 min. 15 sec. with a 60 kva. demand, using two coils. The particular type of heater used in this operation was a 60-cycle low-voltage, low-temperature induction heater.

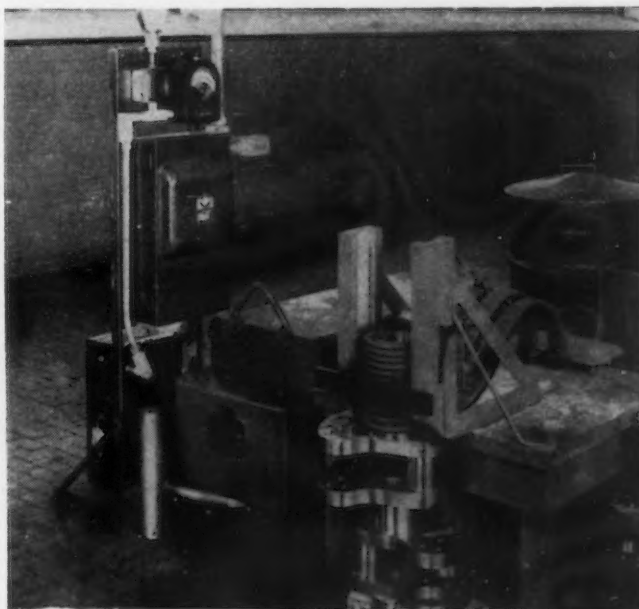
In an aircraft engine plant the same type of transformer was used to heat a steel crankshaft $9\frac{7}{8}$ in. long, having a $4\frac{1}{4}$ in. o.d. and a tapered hole $3\frac{3}{4}$ in. i.d. maximum. In this application, illustrated, the

heater was used to raise the temperature of the crankshaft to about 400 deg. F. so that expansion would permit the insertion of a free-fit bushing. The required heat was obtained with a resulting expansion of from 0.010 to 0.011 in. in a period of about 3 min.

The same type of transformer (heater) but with a 150 kva. rating was used in heating large axles as a preheat for welding. In this in-

stance the axles measured 7 ft. $1\frac{1}{4}$ in. long with a diameter of $4\frac{1}{4}$ in. Heating in this application was obtained by resistance rather than induction and due to the difficulty of making contact with the polished shaft, air cylinders were employed in pressing the contractors firmly against the ends of the shaft. The required temperature of about 500 deg. F. was reached in from 1 to 2 min.

A TEMPERATURE of 350 to 400 deg. F. is created in this aircraft crankshaft in about 3 min. by induction heating. The operation is required to cause expansion sufficient to permit the insertion of freeze-fit bushings.



Detecting Surface Flaws



FIG. 1—A typical Zyglo unit for inspecting small parts. All necessary material and equipment are within arm's reach. The curtained chamber to the right is the inspection station.

NON-destructive detection of surface flaws on well loaded parts is an important production aid in plants producing vital war material. The Magnaflux method* of detecting flaws is most effective on steel and other magnetic parts, but it has not been applicable to such non-magnetic parts as aluminum, brass, magnesium, non-magnetic stainless steels, and such non-metallic materials as bakelite, ceramics, etc. The Zyglo method (U. S. Patent 2,259,400) has

**Described in THE IRON AGE, March 12, p. 47, and March 19, p. 56, 1942.*

been developed by the Magnaflux Corp. to provide a means for testing such non-magnetic materials.

Surface flaws on well loaded parts are great trouble raisers, particularly if the load is constantly varying. For various well known reasons, the surface of a part is more vulnerable than the interior and, consequently, small defects on the surface are more apt to cause trouble in service than much larger defects in the interior.

Many surface defects can be detected visually by a careful observer. But such inspection is slow and less reliable than when the observer is aided by some process which will, in effect, magnify the indication of a flaw. The X-Ray method is excellent for large interior defects, but is less definite on smaller surface defects and, in addition, is costly for a thorough job.

Deep etching is often effective but has the disadvantage of destroying the surface. Magnetic powder inspection is excellent on

FIG. 2—Typical indications of various types of cracks, the defect being indicated by the fluorescent illumination. Left top is an indication of a crack in a tungsten carbide tool bit; left bottom shows cracks in molded bakelite; right top is a service failure crack in a cast aluminum duct; bottom right shows cracks and porosity in a molded ceramic part.

in Non-Ferrous and Non-Magnetic Materials

magnetic materials but, of course, cannot operate on non-ferrous materials. The Zyglo, or fluorescent penetrant method, described in this article is the first really practical method of indicating surface flaws on non-ferrous materials with the certainty, speed and low cost necessary for production inspection.

Operating Principles

The principles of operation of this method are simple. First, the part is coated with a fluid which has the properties of penetration and fluorescence and is water washable. After application of the penetrant to the part to be inspected by dipping, spraying or brushing, the parts are set aside for five minutes to an hour or more, depending upon the tightness of the defect, to allow the penetrant time to work into the flaw, and also to allow excess penetrant to drain off and be recovered.

After this setting period, all excess penetrant is washed off the

... Detection of open surface flaws, such as cracks and shrinkage, in non-ferrous materials, including non-metals, by means of the newly developed non-destructive fluorescent penetrant method is described in this article.

o o o

surface of the parts by a forced spray rinse of warm or cool water. After

the parts are dried, an absorbent developing powder is applied to the surface and the excess shaken off.

This developing powder acts like a blotter in drawing the penetrant back out of the flaws, and also reduces the fluorescence of any surface background. The parts are then inspected under near ultraviolet, or black light, which will reveal surface flaws as bright, glowing indications, as illustrated by the accompanying photographs.

Sensitivity, the minimum width and size of a flaw which will be indicated by the process, is controlled

By GREER ELLIS

Technical Manager,
Zyglo Division of Magnaflux Corp.

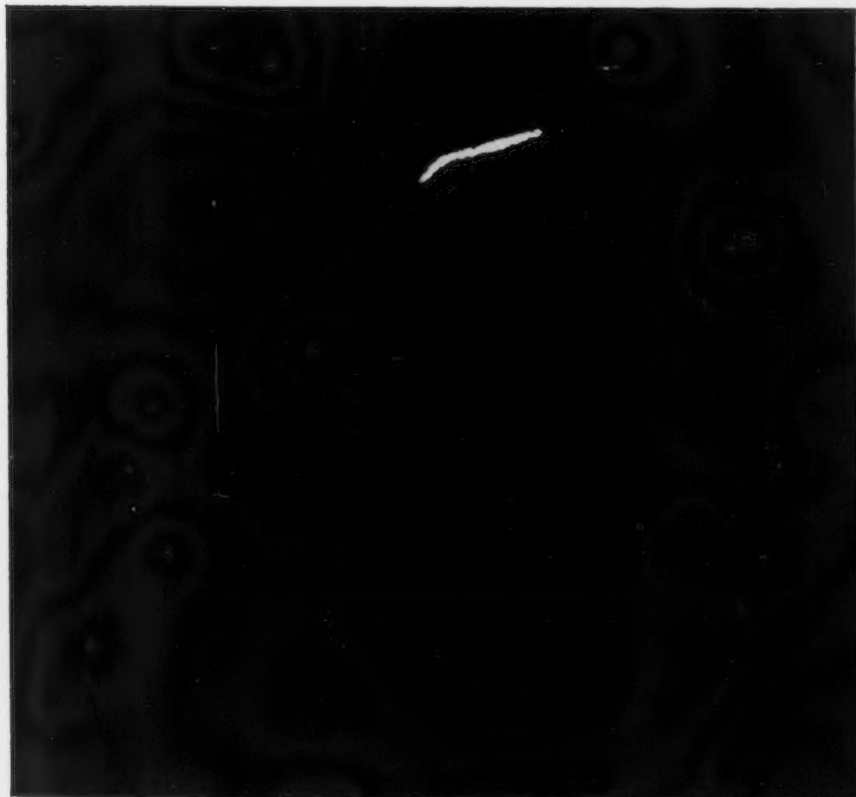
largely by the amount of time allowed for penetration after the part

has been dipped in the penetrant. The tightness of the surface opening of the defect appears to be the principal controlling factor. Shrinkage porosity and cracks and surface pinhole porosity on fresh castings as well as cracks and porosity in molded plastics and ceramics require no more than five minutes' penetration time.

Forging laps, folds in castings and fatigue cracks which have been cleaned of foreign material require, on the average, 15 to 30 min. penetration time for the formation of a satisfactory indication. On the other hand, tight seams in bar stock may require up to 24 hr. penetration time for satisfactory indication. The necessary minimum penetration times are best determined on typical parts for each application.

Surface Preparation

Surface preparation for satisfactory operation of the process must include cleaning away of foreign materials which would clog the sur-



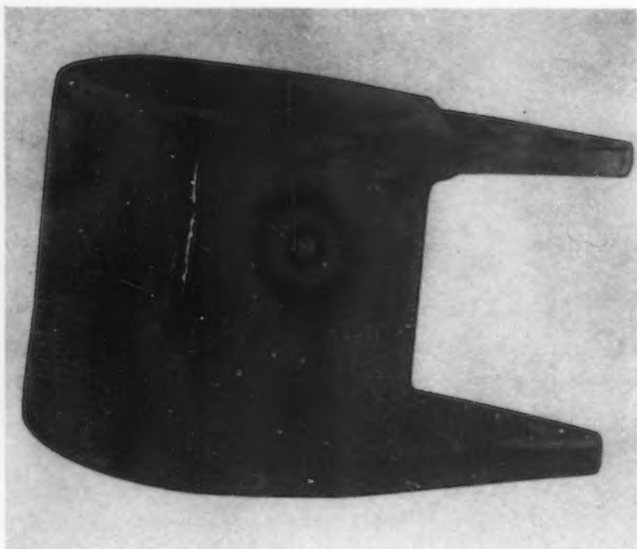


FIG. 3—An indication of a forging lap in an aluminum aircraft fitting remaining after 1/32 in. was removed following fluorescent penetrant treatment.

face openings of defects or would in themselves retain penetrant and produce false indications. Any preceding machining should have been done with sharp tools. Clean grinding, heavy sand-blasting and etching provide suitable surfaces. As-cast surfaces of sand and permanent mold castings have been found to be very satisfactory for the operation of the process. The water rinsable penetrant easily washes out of scratches and minor surface defects of a shallow nature, while remaining tenaciously in true cracks and other deep surface flaws.

Equipment needed for inspection by the Zyglo method is essentially

simple. Fig. 1 shows an operator rinsing off a basket of parts in the rinsing station of a typical Zyglo unit. To his left is a basket of parts resting on a drain board after having been dipped in the tank of penetrant below it. A black light is installed over the rinse station to aid in observing when the parts are clean of all excess penetrant. In the rear of the rinse station is a hot water dip tank which is particularly useful if cold water is used in rinsing the parts. A dip in the hot water tank will warm the parts and enable them to dry much more quickly in the recirculating hot air dryer which can be seen just to the

right of the operator. Next to this dryer is the developing powder tank and, finally, the inspection station which has a hood surrounding the black light to increase the visibility of the indications.

The materials used in this process are neutral in character and harmless to the parts being tested. When properly used, the materials and near ultra-violet lights are harmless to personnel.

Defect Indications

Inspection of the treated casting in the inspection station (Fig. 1) reveals cracks as sharp lines of fluorescent light. Shrinkage cracks form broader, more irregular lines. Shrinkage appears as a general area of illumination and surface pinhole porosity shows as individual points or circles of light. Sound areas remain dark under the black light and contain no areas of fluorescent light.

Cracks are the most detrimental type of surface defect. They may arise at any stage in the life of a part. The original material, be it cast, forged or otherwise formed, may contain cracks which will cause trouble later. Heat treating, drastic cleaning, various forming and machining operations and testing and service operations are each a possible cause of crack formation. Fig. 2 shows cracks arising from several causes.

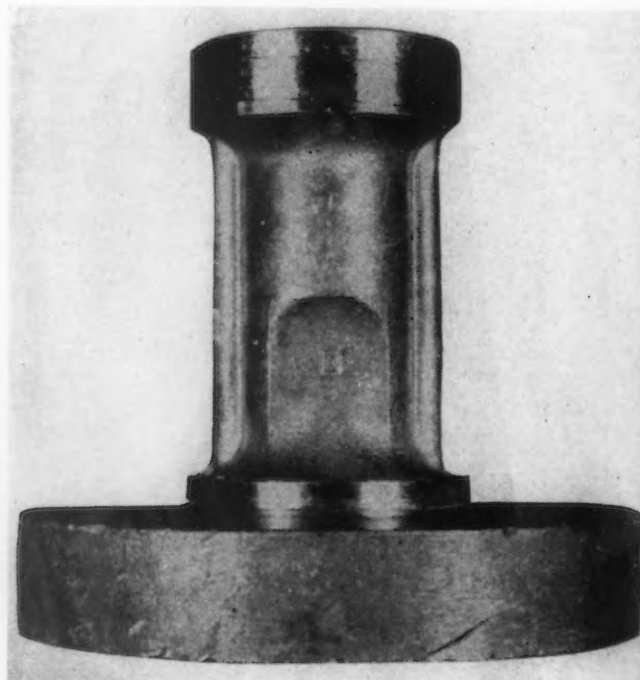
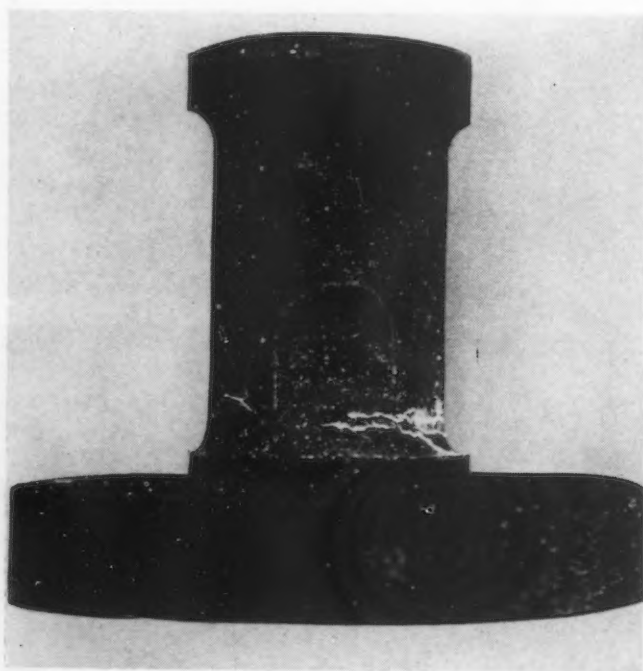


FIG. 4—Shrinkage cracks and scattered pinhole porosity in a permanent mold aluminum casting. The photo to the right shows the casting as it appears under ordinary white light.

Forging laps are a type of crack. Fig. 3 illustrates the indication remaining in a lap with 1/32 in. of the surface ground away after the part had been put through the penetrant treatment. This photograph illustrates how penetration goes practically to the bottom of a flaw. Routing out of a defect can be readily guided by operating under a black light and occasionally dusting on a little developing powder. When all the indication has been removed, another run through the complete process usually shows a slight indication. When this has been removed, the flaw is gone. Salvage of critical parts by such means can result in very appreciable savings.

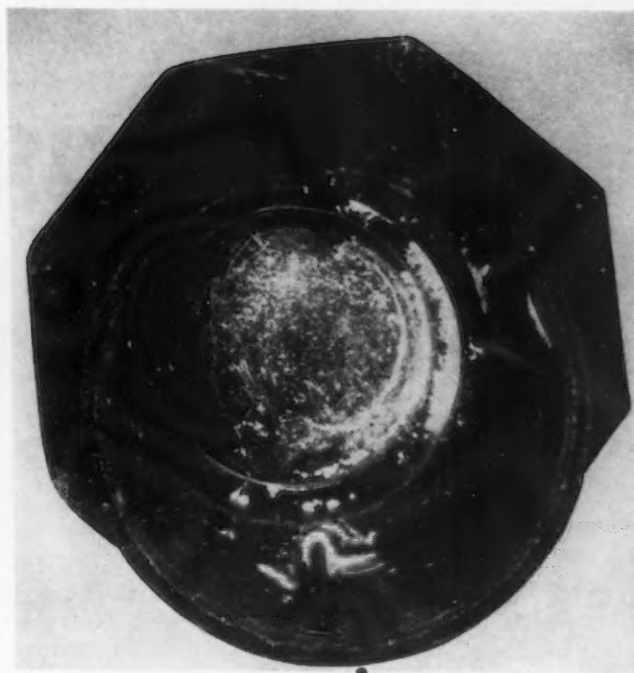
Shrinkage cracks and shrinkage porosity are common defects in sand and permanent mold castings caused by improper design, mold, casting procedure, or type of metal. In heavy sections, shrinkage may stay below the surface and not be detected by surface indications. However, in thin or moderately thick sections, and particularly in the light alloys, shrinkage comes to the surface and can be indicated by the fluorescent penetrant method. Shrinkage, and shrinkage cracks in particular, are serious defects in heavily stressed sections. Fig. 4 shows several shrinkage cracks. For comparison, the same surface is also shown under normal white light. Fig. 5 shows shrinkage cracks and micro-shrinkage on a magnesium part.

Pinhole surface porosity consisting of isolated pores is the least detrimental of surface defects. Indications are tiny dots haphazardly covering the surface such as those in Fig. 4. Unless there is a definite reason for rejection, such as the need for a very clear surface after light machining, these slight flaws are ordinarily ignored.

Leakers

"Leakers," parts which have porosity or cracks extending completely through a wall, may be detected by applying the penetrant to one of the surfaces, taking care that none touches the other surface. Developing powder is applied to the opposite surface and the parts set aside for approximately one-half hour and then examined under black light. In many cases this technique has been found to be as sensitive as methods requiring the forcing of a liquid or gas through the flaw under pressure. The ad-

FIG. 5 — Shrinkage cracks and general micro-shrinkage in a permanent mold magnesium casting.



vantage of using the fluorescent penetrant is that no tight fitting fixtures are needed, it being only necessary to apply a coating to one surface.

The volume of the defect below the surface is indicated in some degree by the breadth of the fluorescent indication. The width of the indication in the aluminum duct in Fig. 2 shows that that crack is quite broad and deep. As a matter of fact, this crack extends completely through the wall.

Interior blowholes not connected with the surface, and inclusions, stringers or filled seams in which foreign material is tightly held in the defect cannot be satisfactorily detected because of lack of an opening. Surface openings closed by paint, dirt, scale, grease, heavy oil and any smeared or peened-over surface material also will not indicate well.

Interpretation

Inspection for flaws is most useful when applied to weeding out of undesirable material at the earliest possible stage in the production process. The logical point at which to make a thorough inspection is with the raw castings, forgings, etc. The next most important place at which to inspect is probably on the finished product. When troubles are found in the finished product, a check back from the finished part down through each process will isolate the factor causing trouble. With the source of trouble known, it is usually possible

to correct the fault. After a short period of 100 per cent inspection, to make certain that the fault will not return, flaw inspection at intermediate stages of production can again be reduced to a minimum.

The decision as to whether an indication is cause for rejection of the material is one which, in the final analysis, can only be made in the light of service experience. An obvious flaw, if it does not cause trouble in service, is no valid reason for rejection of material. Naturally complete service experience on each type of part with all possible flaw indications is a practical impossibility. But, with a background of experience on typical parts, the material engineer can be guided by fundamentals such as the type of service, amount and direction of stress and type of flaw at the place where an indication is present.

The worst condition is a line of weakness, such as a crack, appearing transverse to the direction of maximum tension stress. If this stress is of a fair amount, and particularly if it is constantly repeated, failure in service is practically inevitable. At the other extreme, a small spherical indication in a field of low stress, even though it may be on a critical part, will have little influence on the ultimate life of the part. There is no possibility of making interpretation of defects automatic. Flaw inspection is essentially a matter of engineering judgment, requiring the best talent available.

Welding

Wrought Iron

WROUGHT iron can be welded easily by any of the commonly used processes, such as forge welding, electric resistance welding, electric metallic arc welding, electric carbon arc welding and gas or oxyacetylene welding. The absence of the A₁ point in wrought iron is of importance in reducing internal strains due to welding and in eliminating air-hardening capacity. However, internal strains cannot be eliminated as a factor and stress relieving of welded structures, particularly where heavy sections are involved, is considered good engineering practice today. Temperatures of 700 to 800 deg. F. are usually sufficient to relieve stresses induced through expansion and contraction by the heat of welding. Stress relieving is particularly desirable for equipment that is to be used in certain types of service, such as the handling of strong caustic solutions. The procedure for welding wrought iron by the man-

ual oxyacetylene process is practically the same as that followed in welding soft steel of the same thickness. However, one important point to keep in mind is that the iron silicate or slag included in the metal melts at a temperature which is below the fusion point of the iron base metal. The melting of the slag gives the surface of the metal a greasy appearance. This should not be mistaken for actual fusion of the base metal and heating should be continued until the iron is fully melted.

The best oxyacetylene welds are produced when fusion is obtained without excessive mixing of the parent metal with the weld metal. Too much rubbing or agitation of the molten metal causes the formation of oxides which may be trapped in the weld. Ordinarily, just enough of the parent metal should be fused to provide a sound bond with the filler material.

The selection of welding rod

metal is important. It is advisable to avoid rods containing high carbon or alloys solely intended to increase the strength of the deposited metal. In general, any high quality, low carbon rod such as Airco No. 8 furnished by Air Reduction Sales Co., or Oxxweld High Test No. 1 furnished by the Linde Air Products Co., or Page "C" gas wire made by Page Steel & Wire Division of American Chain & Cable Co. should give entirely satisfactory results with wrought iron.

A neutral flame has been found to give the best results for gas welding wrought iron.

Table I gives the essential details of the procedure to follow in manual oxyacetylene welding of wrought iron. In tests made at the A. M. Byers Co., Pittsburgh, this procedure was found to produce welds of a quality to conform to the X-Ray requirements of the A.S.M.E. Boiler Construction Code for Class I welds.

TABLE I
Manual Oxy-acetylene Welding Procedure for Wrought Iron

Thickness of plate, in.	1/8	1/4	3/8	1/2	5/8	3/4	7/8	1
Type of joint	Single V	Single V	Single V	Single V	Single V	Single V	Single V	Single V
Angle (from perpendicular), deg.	30	40	40	40	40	40	40	40
Included angle, deg.	60	80	80	80	80	80	80	80
Spacing between edges (starting end), in.	1/32	1/16	1/16	1/16	1/16	1/16	1/16	1/16
Spacing between edges (18" from starting end), in.	1/8	3/16	1/4	1/4	1/4	1/4	1/4	1/4
Diameter of welding rod—1st side, in.	1/8	3/16	1/4	1/4	1/4	1/4	1/4	1/4
Diameter of welding rod—root side*, in.	1/8	3/16	3/16	3/16	3/16	1/4	1/4	1/4
Tip sizes**	6	8	9	10	11	12	12	13
Oxygen pressures**	12	14	15	17	18	20	26	28
Number of layers or beads—1st side	1	1	1	2	3	3	4	5
Number of layers or beads—root side*	1	1	1	1	1	1	1	1

*When a double weld is required, as for example under the A.S.M.E. Code, Par. U-68, or U-69, a root bead is used.

**Tip sizes and oxygen pressures are for Oxxweld welding blowpipe No. W17. The acetylene pressure may be any value from zero to 5 lb.

For other types of blowpipes use the tip size, oxygen and acetylene pressure recommended for steel of the same thickness.

In establishing the procedure for gas welding wrought iron, it was found that for the thicker plates either a step-by-step or layer method of depositing beads produced the best results. For example, in the step-by-step method with 5/8 in. thick plates the weld is started by depositing a root bead about 1 1/2 in. long. A second bead is deposited on this and extended about 1 1/2 in. beyond it, forming a new root bead. A third bead completes the weld for the first 1 1/2 in., forms a second bead for 1 1/2 in. and a root bead for another 1 1/2 in. The weld is completed by a continuation of this process. In the layer method, beads of from 3/16 to 1/4 in. depth are used for the entire length of the weld.

Arc Welding Procedure

In welding wrought iron by the electric metal arc process, the best welds are produced when the welding speed is decreased slightly below that used for the same thickness of soft steel. With reduced speed, the pool of molten metal immediately following the arc is kept molten for a longer period of time, thus making for more complete elimination of the gases and affording the entrained slag an opportunity to float out of the weld metal.

Also, it may be necessary to employ a slightly lower current value than that used with the same thickness of mild steel, particularly in welding thin sections.

The penetration should be no greater than that required to obtain a sound bond between the de-

TABLE II
Welding Electrodes Suitable for Wrought Iron*

BRAND NAME	MANUFACTURER
Shielded Arc	Babcock & Wilcox Co.
Blue Devil, Gray Devil, and Red Devil	Champion Rivet Co.
Type W-20 and W-23	General Electric Co.
Fleetweld #5, #7, #8, and #9	Lincoln Electric Co.
Murex Cresta, Type F, Type FHP, Fillex, Vertex, and Genex	Metal & Thermit Corp.
Una 2100, 2500, 3100, and 3200	Una Welding, Inc.
Wilson #98N, #98N-V and O, #107	Wilson Welder & Metals Co.
Page High Tensile C, F, and G Shielded Arc	Page Steel & Wire

*Partial list.

posited metal and the parent metal, because fusion of an excess quantity of the parent metal tends to carry slag into the weld metal.

In metallic arc welding and in gas welding, the choice of filler metal is important. Table II lists a few of the electrodes which have been found to produce highly satisfactory welds with wrought iron. Coated rods are preferred.

As a general principle, it is desirable to have the deposited weld metal as close in composition to the parent metal of wrought iron as possible. It should be recognized, however, that during the welding operation, the metal deposited undergoes a change in composition and some of the elements such as carbon, manganese and silicon, are lost through oxidation. Thus, the welding rod should contain sufficient quantities of these elements to compensate for the loss during fusion so that the resultant weld metal will closely approach the base

metal matrix of wrought iron as regards chemical composition. It is undesirable to select a rod which is initially extremely low in the elements mentioned above.

The welding procedure found to produce sound welds is given in Table III. For certain classes of work where a greater degree of porosity may be permitted, larger electrodes, higher currents and higher speeds may be used. With manual operation it is practically impossible to maintain accurately a given speed, but the proper rate can be closely approximated by timing the actual rate of travel with a stop watch and then making any adjustments necessary.

In manual metal arc welding, as in gas welding, it was found in the tests made by A. M. Byers Co. that welds of a quality to conform to the X-Ray requirements of the A.S.M.E. Boiler Construction Code for Class I welds can be made in wrought iron.

TABLE III
Manual Metal Arc Welding Procedure for Wrought Iron

Thickness of plate, in.	1/4	3/8	1/2	5/8	3/4	7/8	1
Type of joint	Single V	Single V	Single V	Single U	Single U	Double U	Double U
Angle (from perpendicular), deg.	30	30	30	9	9	9	9
Included angle, deg.	60	60	60	18	18	18	18
Radius, in.	None	None	None	1/4	1/4	1/4	1/4
Tongue, in.	0 to 1/16	0 to 1/16	0 to 1/16	3/32	3/32	3/32	3/32
Spacing between edges, in.	5/32	5/32	5/32	None	None	None	None
Number of passes	3	4	5	6	8	9	10
Diameter of electrodes, in.	3/16	3/16	3/16	3/16	3/16	3/16	3/16
Amperes	170	170	180	180	180	180	180
Recommended rate of travel of electrode in in. per min.							
1st bead—1st side	8	8	7	7	7	6	6
Intermediate beads—1st side	5	5	5	5	5	5	5
Last bead—1st side	5	5	4	4	4	4	4
1st bead—2nd side	5*	5*	4*	4*	4*	6	6
Intermediate beads—2nd side	..	..	..	..	..	5	5
Last bead—2nd side	..	..	..	..	..	4	4

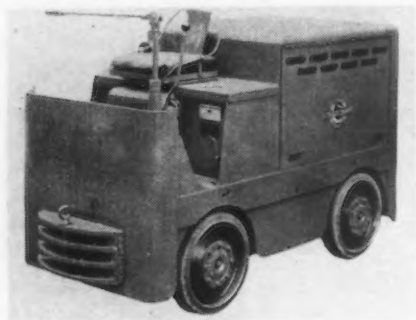
*Not used unless a double weld is specified.

New Equipment . . .

Material Handling

Some of the more recent developments in conveying equipment, cranes, electric trucks, hoists, magnetic separators and other material handling equipment are discussed herein.

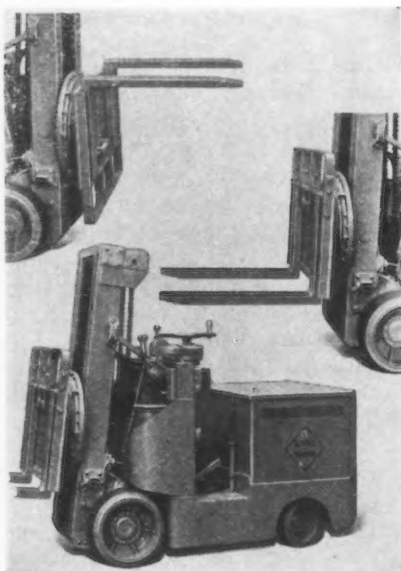
POWERED by two heavy duty tractor drive units, including two motors, the model NTTD tractor, made by *Crescent Truck Co.*, Lebanon, Pa., provides a maximum of traction, safety and flexible operation, according to the maker. The tractor features four-wheel, extra large external contracting brakes, mounted on worm shaft, providing equal braking on all wheels. The model NTTD has a drawbar pull of 800 lb. normal, 3600 lb. ultimate. Overall length is 84 in., wheel base 48 in., overall height 59 in. Travel is controlled by a lever-operated drum-type controller,



which is interlocked automatically with the operator's seat and brake pedal. If controller is left in any speed position, handle must be brought to neutral, with brake released and operator seated, before power can be applied.

Center Control Fork Truck

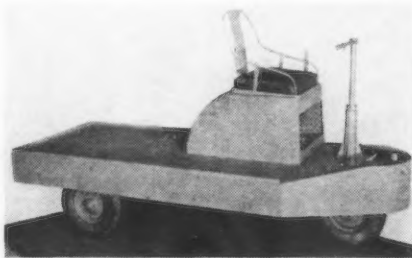
ELWELL-PARKER CO., Cleveland, is supplying its center control truck, type F-23T, with forks on a rotating base capable of making a complete revolution. Should the work call for only a partial revolution, the base can be provided with stops to limit the swing to any angle up to 180 deg. At top position the rotating forks carry either suspended or supported loads—the latter for extra high tiering. When locked into place at the bot-



tom, they handle pallets or low skids with no adjustment whatever. The truck is electric-powered, with front wheel drive and rear wheel steer. It handles up to 4000 lb. and travels up to 5 miles per hr. with full load. Tilting uprights are 83 in. high when telescoped and can be extended to 140 in.

1/2-Ton Industrial Truck

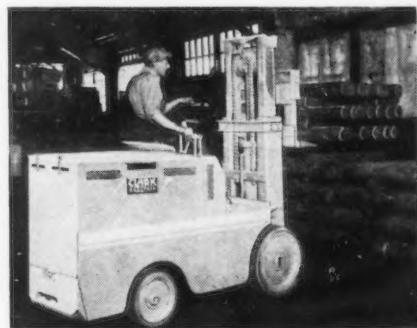
A NEW 1/2-ton capacity industrial truck suited for delivery of tools and materials between machines, toolrooms and storerooms, has been announced by the *Buda Co.*, Harvey, Ill. The unit is also suitable for transporting officials around a plant. The truck, called the "Chore Boy," weighs 800 lb. and has 12.8 sq. ft. of deck space. Maxi-



mum speed is 15 miles per hr. Power is furnished by a 7.7-hp. air-cooled 4-cycle engine which gives 35 to 38 miles on a gallon of gas. The truck is especially handy for use in narrow aisles, as its width is 37 in. and its turning radius is 7 1/2 ft. The brake is of the internally expanding type on the intermediate shaft and will hold a fully loaded truck on an incline or ramp. Arrangement of the deck permits carrying bulky material, tote boxes or long items.

Electric Trucks

CLARK TRACTOR DIVISION of *Clark Equipment Co.*, Battle Creek, Mich., who have heretofore built gas-powered vehicles for handling materials are now offering them with full electric equipment for storage battery power. The machines lift from 2000 to 7000 lb., using a hydraulic vane type pump driven by special series wound motor. The same pump operates the tilting unit, which enables the operator to tilt the load back 10 deg. in 5 sec. for safe riding and tilt it forward 3 deg. in 1 sec. for



tiering. The machines have four speeds forward and four speeds in reverse, with speeds up to 6 mph. under full load, 7.5 mph. empty. The trucks will climb 7 1/2 per cent grades under their maximum loads. Drive is on the front wheels with rear wheel steer.

Turret Truck

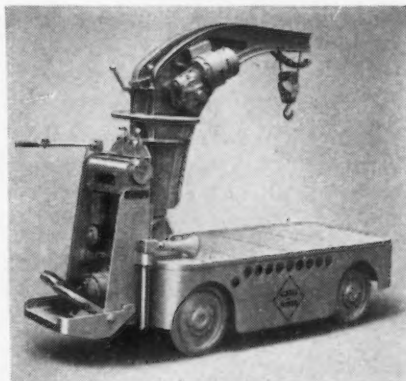
NUTTING TRUCK & CASTER CO., Faribault, Minn., has introduced the Salsbury turret industrial trucks available in lift, cargo and tractor types, with the engine power assembly contained within a turret over the drivewheel. Steering is done with the driving wheel. Main frame of power plant is mounted rotably in ball bearings which permits steering in any direction over a 360 deg. arc. To reverse direction of travel, the operator reverses the turret and drivewheel in one and the same motion. Powerplant is a single cylinder, 4-cycle, air-cooled engine.



It provides a maximum speed of 8 miles an hr. under full factory rated loads. Self-shifting transmission is automatic and provides variable drive ratios between 60:1 in "low" and 20:1 in "high." Drive ratios are entirely controlled by travel speed. Automatic clutch engages as engine is accelerated, disengages when engine idles.

Combination Crane and Truck

A NEW power industrial transportation unit, made by the Elwell-Parker Electric Co., Cleveland, combines the functions of a load carrier, a crane and a tractor. As a load carrier, the unit has an unobstructed platform 84 in. long x 40 in. wide x 25 in. high, with a rated capacity of 6000 lb. As a crane handling up to 2000 lb. at 42 in. on the boom, it lifts and transports castings or other heavy objects. As a tractor, it first loads the trailers by means of its own crane, then hauls them at speeds up to 5 mph. The truck operates with 2-wheel drive and 4-wheel steer. The boom is of special design, of heavy formed channel members rigidly reinforced with tie rods, lattice bars and gusset plates and slews around a 3½ in. diameter alloy steel pillar. Thrust load is taken on oversize ball bearings at the base of column;



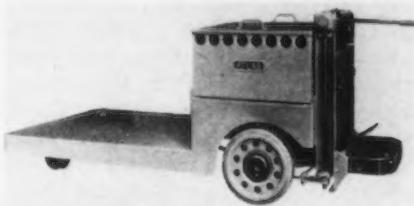
radial loads on roller bearings at both top and bottom.

Hand and Electric Lift Truck

A NEW electrically operated hand-lift truck known as the PowerOx is announced by the Barrett-Cravens Co., 3262 W. 30th Street, Chicago. With this truck loads are lifted by a series of vertical handle strokes. When the load is raised to the desired height, electric power is transmitted to the two rear drive wheels by means of a hand control. The unit has two front wheels widely spread for easy steering and stability of load. It has a capacity of 4000 lb. and is available in widths of 19 and 25 in. Platform lengths are 48 and 60 in. A feature is two drive motors—a motor drive on each rear wheel.

Platform Truck

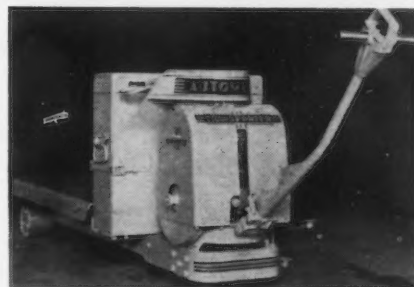
ATLAS CAR & MFG. CO., 1100 Ivanhoe Road, Cleveland, is offering its improved Model LWH platform truck. The drive axle is made in one piece and is totally enclosed. Automobile type hardened gears, ball bearing mounted, are arranged for easy removal of motor separately, or with motor and gearing complete. It has traction brakes of the external contracting type on motor shaft with two shoes, automatically applied by spring pres-



sure when the operator releases foot pedal, at which time controller interlock also opens electric circuits. The truck has a capacity of 6000 lb. and a speed of 4½ mph. under load.

Lift Truck

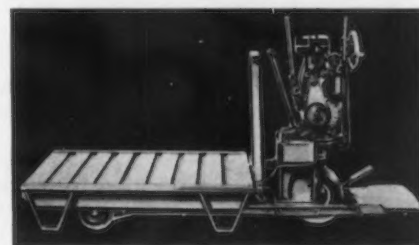
A HYDRAULIC lift platform, called the Transporter, is offered by the Automatic Transportation Co., 115 W. 87th Street, Chicago. The unit has a capacity up to 6000 lb. Heavy-duty hydraulic ram gives 3½ in. lift through foot operated lever. Electric power carries Meyers-14 9on10x13 Dec. 7 I A the load at safe walking speed. Movements of the handle give the operator complete brake and speed control. Drive control consists of



forward and reverse speed push buttons built into handle grip for thumb tip contactor control. Controller is mechanically interlocked with drive unit brake, which is automatically applied when steering handle returns to vertical position. Trail wheel sizes may be had for platform from 6 to 11 in. high, with grade clearances from 2¾ in. to 5⅞ in. Battery has power for 8 to 10 hr. daily operation.

Motorized Lift Truck

THE "Truck Man," a motorized platform truck, is offered by Yard-Man, Inc., 1410 W. Ganson Street, Jackson, Mich. This truck has a capacity of 2000 lb. It is pow-



ered with a 1½-hp. air cooled gasoline motor which drives two pneumatic tired wheels. Load wheels are solid rubber. Lifting is by hydraulic power. The Truck-Man turns in its own length and is easily and quickly reversed by rotating the power unit 180 deg. It operates in both directions, and both forward and reverse speeds are the same.

High Capacity Lift Trucks

A LINE of high capacity lift trucks for handling loads indoors or out is offered by the *Ross Carrier Co.*, Benton Harbor, Mich. For safety in operation, maximum visibility is obtained through open design of fork carriage and position of driver's seat. Lowering speeds are controlled automatically without limiting unloaded down-speed of carriage. Pneumatic tires absorb shocks, permit low unit ground pressures and provide stability when operating on rough ground,



snow or mud. All operating parts, including hoist, tilt and drive mechanisms, are enclosed and run in oil. These trucks have a capacity from 3 to 7 tons.

Traveling Railroad Crane

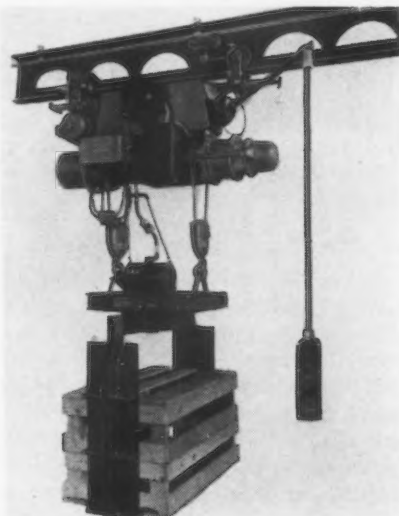
INSLEY MFG. CORP., Indianapolis, Ind., has announced a new 4-ton traveling railroad crane. The crane weighs approximately 11 tons and has traction drive on all four wheels. It is full revolving and swings at a speed of 5.9 r.p.m. All



controls, including brakes, are centralized at the operator's position in the cab.

Crate Grab and Carrier

A MOTOR-DRIVEN crate grab and carrier especially designed for handling crates and boxes in and out of storage or from one



elevation to another, has been developed by the Cleveland Tramrail Division of the *Cleveland Crane & Engineering Co.*, Wickliffe, Ohio. The grab and carrier are completely motorized with all operations controlled by six push-buttons. The arms of the grab are extended and retracted by means of geared slide bars that are driven by the motor mounted on top of the grab. A double-hook cable type electric hoist elevates and lowers the grab with very little swing, making it easy to spot it as desired. A quick acting electric brake stops and holds the load wherever desired. The unit illustrated will lift loads up to 1500 lb. a distance of 20 ft. The arms may be spread to a maximum of 36 in. and retracted to a minimum of 18 in.

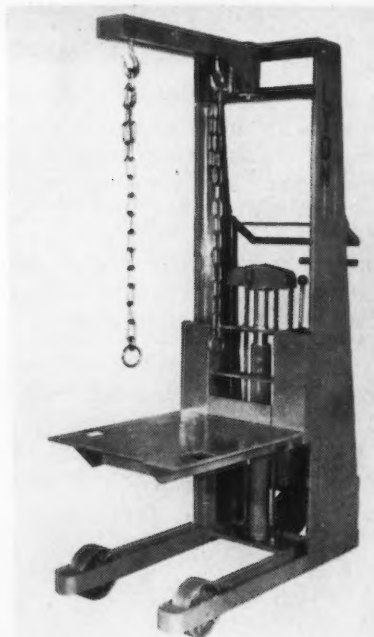
Self-Alining Idler

A NEW self-alining idler for flat conveyor belts, both return and carrying, which will help keep the belt central on its supporting idlers, is announced by the *Chain Belt Co.*, 1600 W. Bruce Street, Milwaukee. If for any reason the conveyor belt runs to one side, it has a tendency to swivel the idler in a horizontal plane. If this in itself is not sufficient to cause the idler to swing enough to force the belt to throw back immediately, the belt will continue traveling to one side until it contacts the counterweight-

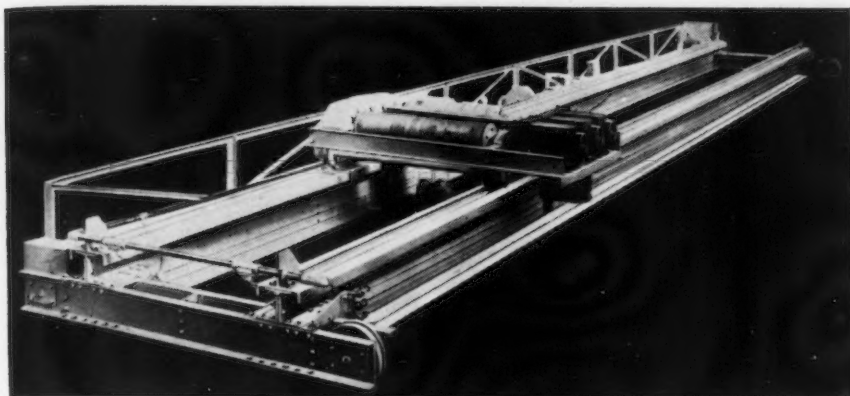
ed end disk, which is slightly larger in diameter than the idler roll. Contact with the counterweight tends to rotate it, but since it is a counterweight, it resists this tendency to rotate and produces a counterforce on the idler. This causes the idler to swivel rapidly, throwing the idler more out of line which then immediately forces the belt to swing back the other way.

Die Handling & Stacking Truck

A FLEXIBLE piece of equipment, known as the Lyon hydraulic die handling and stacking truck, has been offered by the *Lyon-Raymond Corp.*, 1060 Madison Street, Greene, N. Y. The unit has a capacity of 1000 lb. and is furnished with removable die handling boom and removable platform. Boom can be attached either to the carriage or the uprights. It may be used in lifting and stacking barrels and other materials, also lifting skid load of dies. In this case the platform alone is used. With the

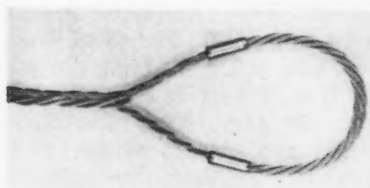


platform removed and the boom attached to the carriage frame, the truck may be used as a crane to pick dies up from the floor and place them on skids. With the boom in position on top of the frame and the platform in position on the truck carriage, as shown in the illustration, with skid and die in elevated position, the truck may be used to separate dies. This is accomplished by fastening the chains (hanging from the boom) to the upper half of the die and then lowering the platform.



Overhead Electric Crane

A LOW-HEADROOM overhead electric crane, known as the type DM, has been introduced by Conco Engineering Works Division of H. D. Conkey & Co., Mendota, Ill. The low headroom feature is achieved by mounting the drum parallel to the hoist motor and bringing the hook block up between. The machine is available in capacities from 3 to 15 tons. Trucks have large diameter wheels with Hyatt roller bearings. All gears and holding brake operate in a bath of oil. High carbon forged steel is used to form the trolley wheels. Standard NEMA foot mounted motors are furnished and any standard type control can be supplied. On d.c. cranes, dynamic lowering is used. The hoist motor is equipped with a large solenoid brake and magnetic type limit switch. Cable is flexible plow steel and all capacities are provided with a minimum factor of safety of 5:1.



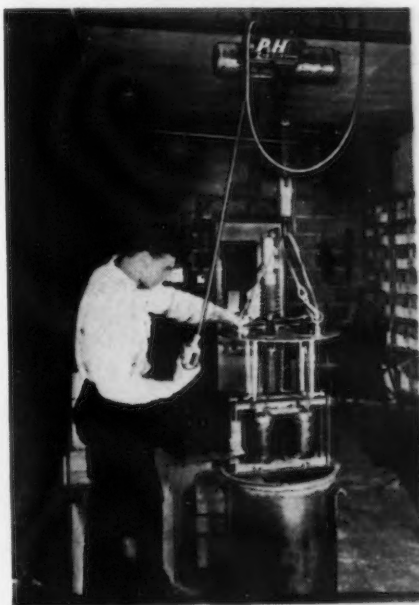
Wire Rope Sling

"FLATWEAVE" is the trade name of a new wire rope sling developed by the John A. Roebling's Sons Co., Trenton, N. J., developed for lifting light and medium loads where the legs choke the load or the sling comes in direct contact with the load being lifted. The Flatweave body is made up of six separate ropes. Two pairs of two ropes each are laid in opposite directions and are united into a finished sling unit by two single tie ropes which alternately pass back and forth around one pair and then the other

in a spiral figure eight. The loops, which can be used as chokers without the use of thimbles, are generously proportioned and easily slip over crane hooks or lifting lugs. The compact steel sleeves are compressed over all rope ends, thus permanently securing them.

Electric Hoist

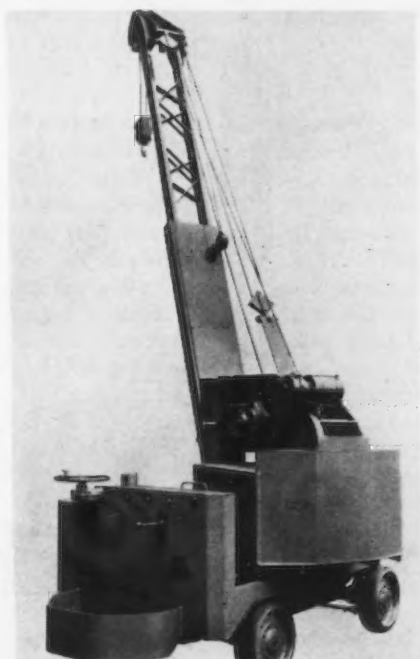
TO meet demands of war plants for a Zip-lift hoist of 1-ton capacity, Harnischfeger Corp., Milwaukee, has announced that its 2000 lb. model is now in regular production. This model, while in the line since the Zip-lift hoist was introduced, was heretofore available on special order only. The 1-ton Zip-lift is equipped with the same features as the smaller Zip-lift models, which include full magnetic push-button control, pre-formed non-spinning hoist cables, safety type limit switch, double brakes, and dust-and-weatherproof-fully-enclosed construction. Designed for quick interchangeable mounting, either trolley, hook, rigid or bolt,



the Zip-lift can also be parallel or cross mounted.

Heavy-Duty Crane Truck

THE Baker Industrial Truck Division of the Baker-Rauling Co., 2168 W. 25th Street, Cleveland, announces a heavy-duty 10,000-lb. capacity crane truck, known as the Type CXF. The mast on which the superstructure slews is a tall member giving two widely separated points of bearing which result in low bearing loads. This mast height permits a higher position for the topping cable idler sheave than is possible with other designs. All



controls are located on the dash and do not swing with the superstructure. Safety of operation is assured because the bridging over the top of the battery compartment is closely spaced so that the operator may look easily along either side.

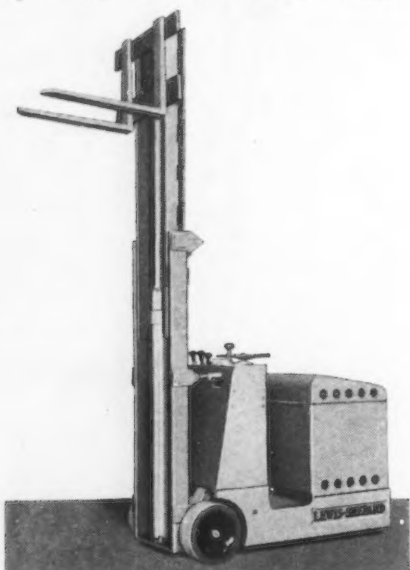
Lifting Magnet

SEVERAL improvements have been made in the magnets produced by the Ohio Electric Mfg. Co., 5900 Maurice Avenue, Cleveland. Two magnets are produced, one having a six layer and the other an eight layer coil, which increases the magnetic intensity and the lifting capacity to 135 per cent and 175 per cent respectively. For handling steel at from 500 to 1200 deg. F., a hollow manganese steel bottom plate has been developed. The hollow spaces are filled with high temperature magnesium fire brick

which resists the passage of the external heat and enables the magnets to handle hot materials continuously. To prevent movement and gear wear, square holes in the chain gears are cast and the chain pins are square, but rounded between the gears. A magnet filling compound which may be forced into the magnet solidifies to a springy consistency when heated and supports the coil against side blows, but does not liquefy or evaporate.

Industrial Lift Trucks

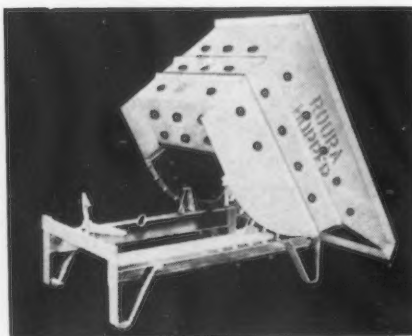
LEWIS-SHEPARD CO., 123 Walnut Street, Watertown, Mass., announces a line of medium capacity industrial lift trucks. These



trucks are of the tilting fork type, telescopic and non-telescopic. These trucks are offered in both gas and EFTT, illustrated, has a capacity electric powered models. The model of 3000 lb. on 36-in. forks. Traction motor is controlled by a General Electric cam operated type controller. Hydraulic power is controlled by balanced type spool valves, spring returned to off position. The trucks are compact and low-slung, with a one-piece reinforced, single casting main frame which keeps the center of gravity low and thus adds to maneuverability and stability.

Hopper for Hot Materials

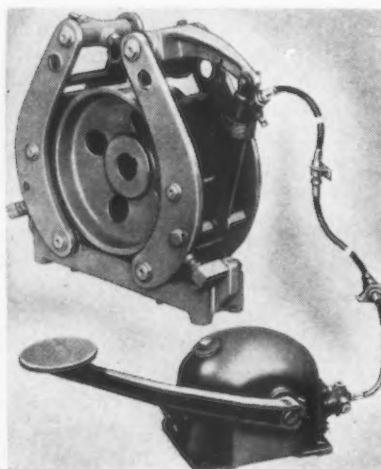
A NEW automatic dumping hopper, designed expressly for the handling of hot forgings, castings or other materials, has been introduced by Roura Iron Works, 1405 Woodland Avenue, Detroit. These units are built in standard



1-yd. capacity with perforations to suit individual requirements. Full 3/16 in. plate is used throughout, electrically welded for permanence. The hopper unloads automatically when trip lever is released and returns to loading position when empty. Standard units will fit any standard type lift or tiering truck.

Hydraulic Crane Brake

AS a result of experiments and tests of hydraulic brake design, Harnischfeger Corp., Milwaukee, announces that all P & H overhead traveling cranes will be furnished with a new type brake. The new design eliminates the need of a separate supply tank, the fluid now being placed in the foot-operated master cylinder. Other features are hard bronze bushings which permit close fits; alloy cast steel iron

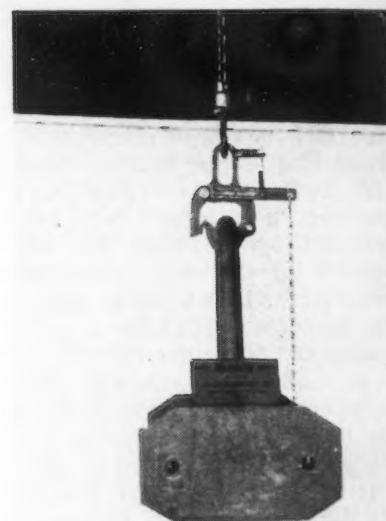


wheel; and swing-open jaws which allow quick removal of wheel without disturbing brake adjustment. Wear adjustments are made by turning two nuts.

Release Mechanism

A QUICK release mechanism which will permit impact tests to be made has been developed by J-B Engineering Sales Co., New Haven, Conn. From the mechanism

is suspended a weight which may be of any shape. This weight is hung on a swinging link which is supported at one end by a fixed pivot. The other end is supported on a movable trigger. As long as the load is on the hook it may safely be lifted. When it has reached the point from which it is to be dropped, the chain illustrated is pulled, releasing the pivoted link and dropping the load. A spring is used for quick return of the trigger mechanism.



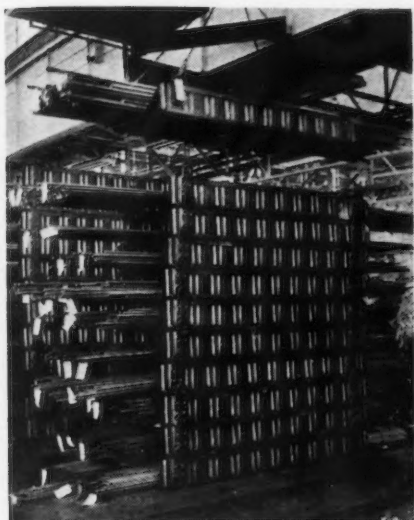
Shop Boxes

THE style 200 straight side shop boxes have been added to the line of the American Metal Works, 1517 Germantown Avenue, Philadelphia. These boxes are available in two standard sizes: 6 in. wide x 9 in. long x 3 1/2 in. high—20 gage, and 8 in. wide x 12 in. long x 4 in. high—20 gage. They are light in weight and easy to handle. If the standard sizes do not meet requirements, boxes may be made in any size or gage of metal.



Inverted Skid Platforms

A NEW type material handling unit, an open-end inverted skid, has been developed by the Union Metal Mfg. Co., Canton, Ohio. This unit was developed for the movement and storage of long



bars or odd-shaped parts. Primarily, it is a standard Union Metal steel skid platform turned upside down and equipped with eye brackets for the insertion of crane hooks. Their corrugated design provides strength and durability.

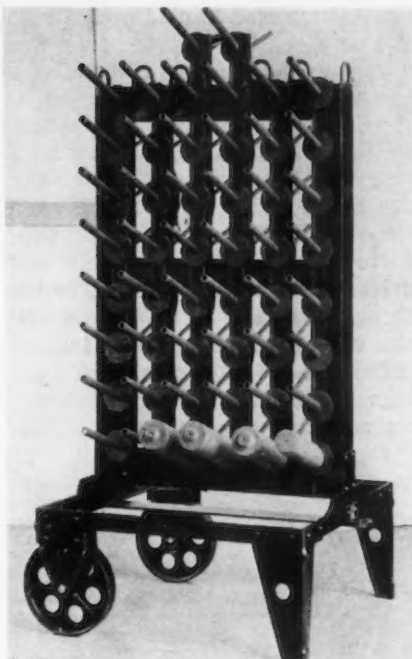
Insulated Skid Box for Forgings

A SPECIAL skid box for storing and cooling hot forgings has been developed by the *Union Metal Mfg. Co.*, Canton, Ohio. The unit has a 7-gage skid, a 9-gage outer casing, and a 12-gage inner casing with a $\frac{3}{4}$ in. asbestos lining in between. The lid is also reinforced and insulated. This box is filled with hot forgings, picked up by a crane or lift truck, then stored out of the way until the forgings have completely cooled. This method provides better insurance against flaking and the time formerly spent in burying and uncovering forgings is saved. The box can be supplied in sizes to meet individual requirements of the user.



Portable Shell Racks

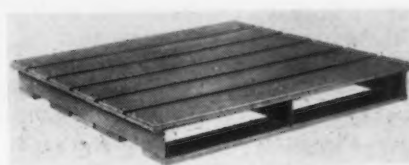
PORTABLE shell racks for handling hot, rough or finished work have been developed by *Factory Service Co.*, Milwaukee. The racks are mounted on a standard transport chassis which can be moved by an industrial lift truck, a hand lift or by crane. The rack illustrated accommodates 100 pieces on steel pins welded at 20 deg. to



the frame. When used for handling shells during finishing operations, the pegs are fitted with rubber hose and disks to protect the machined inner shell surfaces. These racks are made in various sizes.

Wooden Pallet

UNION METAL MFG. CO., Canton, Ohio, has designed a sturdy pallet, consisting of top and bottom wood slats, reinforced with steel at the ends and in the center. Bolted construction permits easy replacement of the wood slats, while the steel ends protect the pallet from damage by power fork trucks. These new pallets are available in sizes to meet any ordinary material handling requirement.



Hand Truck

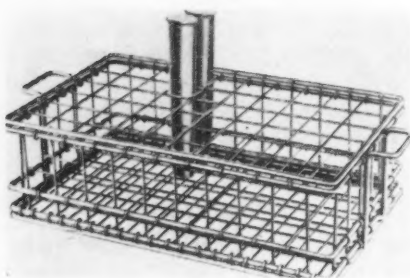
THE Upsy truck, a new addition to the line of the *American Pulley Co.*, 4200 Wissahickon Avenue, Philadelphia, is designed for the handling of any container having a chime or bead. Handling up to 1000 lb., the truck loads a drum without the need of first moving it away from adjacent drums. A sliding hook on the truck's center rail catches the top bead or chime of drum or barrel. The trucker pulls down on the handles, tilting the drum toward him, allowing nose prongs to slide under bottom bead of drum or barrel. Then, as truck handles are lowered to trucking position, the nose prong lifts the drum or barrel off the floor. Range of the adjustable hook is from 16 to 40 in.

Magnetic Pulley Separator

AN unusual combination picking belt and magnetic pulley separator unit has been designed by *Stearns Magnetic Mfg. Co.* of Milwaukee, for the purpose of reclaiming brass and secondary metals from assorted junk and metallic refuse of all kinds. The separator can be designed in sizes to suit the application. The drive is by motor reducer and generator installed within the machine and equipped with covers that can be opened to provide access to the drive. The arrangement of picking belt ahead of the magnetic pulley provides means for sorting the material by hand to eliminate bulky junk before reclaiming the brass from the remaining metallic refuse.

Wire Baskets

TO facilitate and speed up handling of shot, caps, shells and similar products, *Union Steel Products Co.*, Albion, Mich., offers heavy-duty wire baskets. These baskets stack high with safety and offer protection to shot. All divider and bottom support wires are both welded and wrapped around the heavy frame wires. Hot dip galvanized finish is standard.



Steel Carrier Frames

LYON METAL PRODUCTS, INC., 3145 Clark Street, Aurora, Ill., has introduced steel carrier frames built up with wood liners for the storing and protection of finely machined and highly finished parts and tools. The frame is a rectangular container without bottom, but with side walls formed into a channel shape to strengthen and hold wood inserts in position. The frames are made in two sizes: 30 x 20 x 5 3/4 in. and 30 x 30 x 3 3/4 in. Three types of wood inserts may be used: (1) Carriers with partitions, (2) carriers with holes, and (3) carriers with pegs. When partition type inserts are used, 679 space sizes are possible.

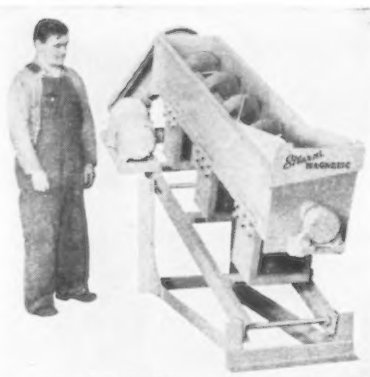
Engine Operated Crane

THE model 805WM Mobilcrane is the latest addition to the line of the *Osgood Co.*, Marion, Ohio. All operating functions of the machine are controlled by air power. An extra wide chassis and the use of 18 rubber tired wheels (12 at the rear and six at front) make it possible to lift loads up to 30 tons over the side of the machine as well as the ends, and carry the load to the desired station. The tandem rear wheel drive unit is arranged to oscillate up and down. The drive from the differential shaft to the driving axles is by heavy roller chain. The crane is steered through the use of a double acting hydraulic cylinder attached

to the front axle, which slews the axle in the desired direction. The independent boom hoist is mounted in the upper part of the gantry, and is operated by two large twin disk clutches. A self-locking worm and worm wheel is driven by a pair of bevel gears. A safety brake is also provided to prevent the boom from running down under heavy loads.

Magnetic Log Washer for Abrasive

AN improved type of magnetic log washer for treating fine abrasive and similar materials in the wet state has been designed by the *Stearns Magnetic Mfg. Co.*, Milwaukee. This washer consists of a single ribbon type screw conveyor operating at 30 to 32 r.p.m. on a slope with adjustable frame supports over the magnetic field and driven by a gear reduction motor through variable pitch V-belts and sheave. The material to be treated is fed into the washer trough. Tailings are discharged at the lower end and the concentrates at the top.



The magnetic flux of the coils is controlled by rheostats. These log washers can be made in various sizes, the one illustrated being 12 x 72 in. They will operate from d.c. up to 300 volts, or from motor-generator sets.

Laboratory Magnetic Separator

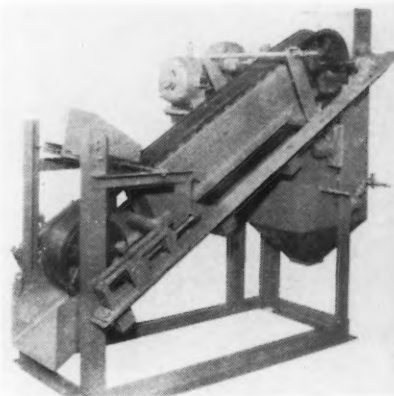
THE Stearns Style "D" size O separator, made by *Stearns Magnetic Mfg. Co.*, Milwaukee, is designed to be used in laboratories. It features an inductively magnetized revolving take-off ring employed to carry the magnetic material beyond the conveyor belt to final delivery. Two magnetic and one non-magnetic products can be produced with this machine. Provision is made for adjusting the separator while in operation. This ap-



plies not only to the magnetic air gap, but also to the flux density of the magnets. This type separator is particularly suitable for handling material of feebly magnetic properties. It occupies a floor space of 2 ft. 9 in. x 1 ft. 5 in. and is 2 ft. 6 in. high.

Magnetic Separator for Grindings

DINGS MAGNETIC SEPARATOR CO., 509 E. Smith Street, Milwaukee, announces a newly improved Dings high intensity Roche type magnetic separator. This unit, and others, have recently been installed for the reclamation of alloy steels from grinding fluids. The coolant fluid from the grinder is fed to the magnetic separator. Suspended in the fluid are particles of abrasives and particles of alloy steels. The magnetic portion of the fluid is pulled along by the main conveyor belt over a series of alternating pole magnets. A water spray continually washes the material as it goes from pole to pole. All non-magnetic materials are therefore washed clean from the product. A welded stainless steel cover encases the electro magnet coils. The separator is furnished complete with motor drive.





Magnetic Separator

STEARNS MAGNETIC MFG. CO., Milwaukee, has made new improvements in their Type "R" Wetherill cross belt magnetic separator. Much of the heavy frame work which formerly supported the coils has been eliminated. The Type "R" separator employs the cross belt method of separation, the material being fed by a special feeding device onto the main belt and the magnetic portions being intercepted and carried to special chutes on the side. These units are constructed in many and varied combinations, having one or more magnets, the windings of which are made very powerful, being separately controlled by rheostat. Ammeters in circuit with the windings provide for accurate readings, and make possible the regulation of each magnet by the resistance method to a definite power or magnetic force.

Core Drying Racks

FACTORY SERVICE CO., 4621 North 21st Street, Milwaukee, has developed racks for drying cores in foundries. Pans containing the cores can be set on the grid shelves and the entire unit moved into the oven. These are standard units of the Turner shop system—consisting of shop trucks, portable



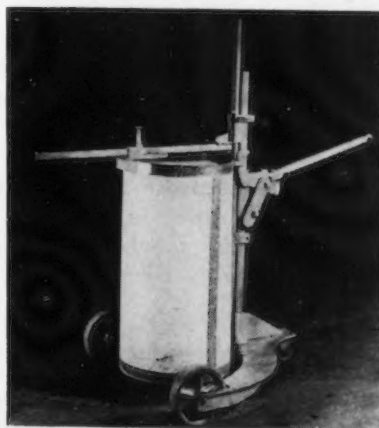
bins, racks, tote boxes, trays, etc. The transport is the basic unit and can be moved with the hand jimmy (shown in the picture) or by power lift truck, crane, tractor or conveyor. All units of the Turner shop system are inter-

changeable and interlocking. When the racks are not needed for drying cores, they may be removed and the transport used for other purposes.

Other items included in the Turner shop system are a modified slide shelf rack mounted on a transport chassis and a superstructure or skeleton rack, designed to accommodate the company's standard shop boxes and trays. These units can be moved in restricted space with a hand jimmy. Boxes and trays can be taken out of the rack and used at machine, bench or assembly line. Standard trays are 14 x 31 in. and 14 x 14 in.

Drum and Barrel Carrier

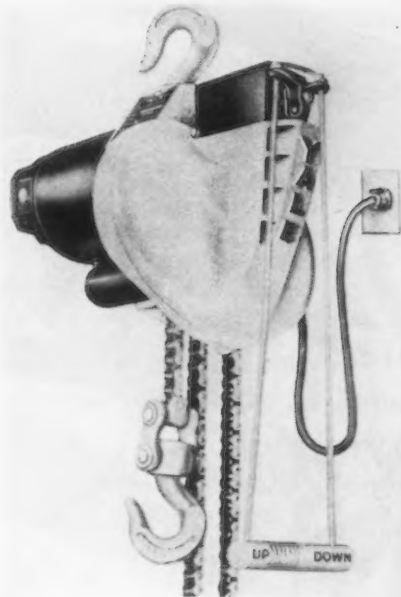
A NEW drum and barrel carrier, designed to handle light wood, fiber, paper barrels and "one-trip" light gage steel containers with or without chimes, is offered by the **Ernst Magic Carrier Sales Co.**, 1456 Jefferson Avenue, Buffalo. Its capacity is 800 lb. and it will accommodate drums and barrels from 14 to 24 in. in diameter. Three-wheel



construction automatically balances the load. Operation is simple. An important feature is the straight, vertical lift of the barrel from the floor to prevent any flowing over of contents from open-head containers.

Small Electric Hoists

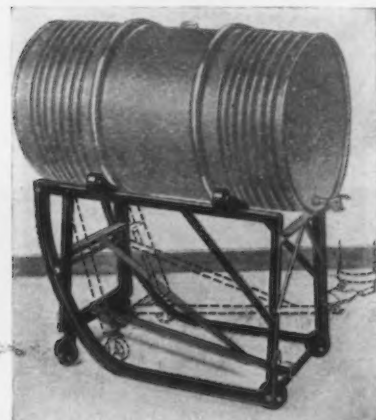
"MIDGET KING" is the name given a new line of electric hoists made by **Yale & Towne Mfg. Co.**, Philadelphia, with a capacity of $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$ and 1 ton. This hoist can be carried to any place in the

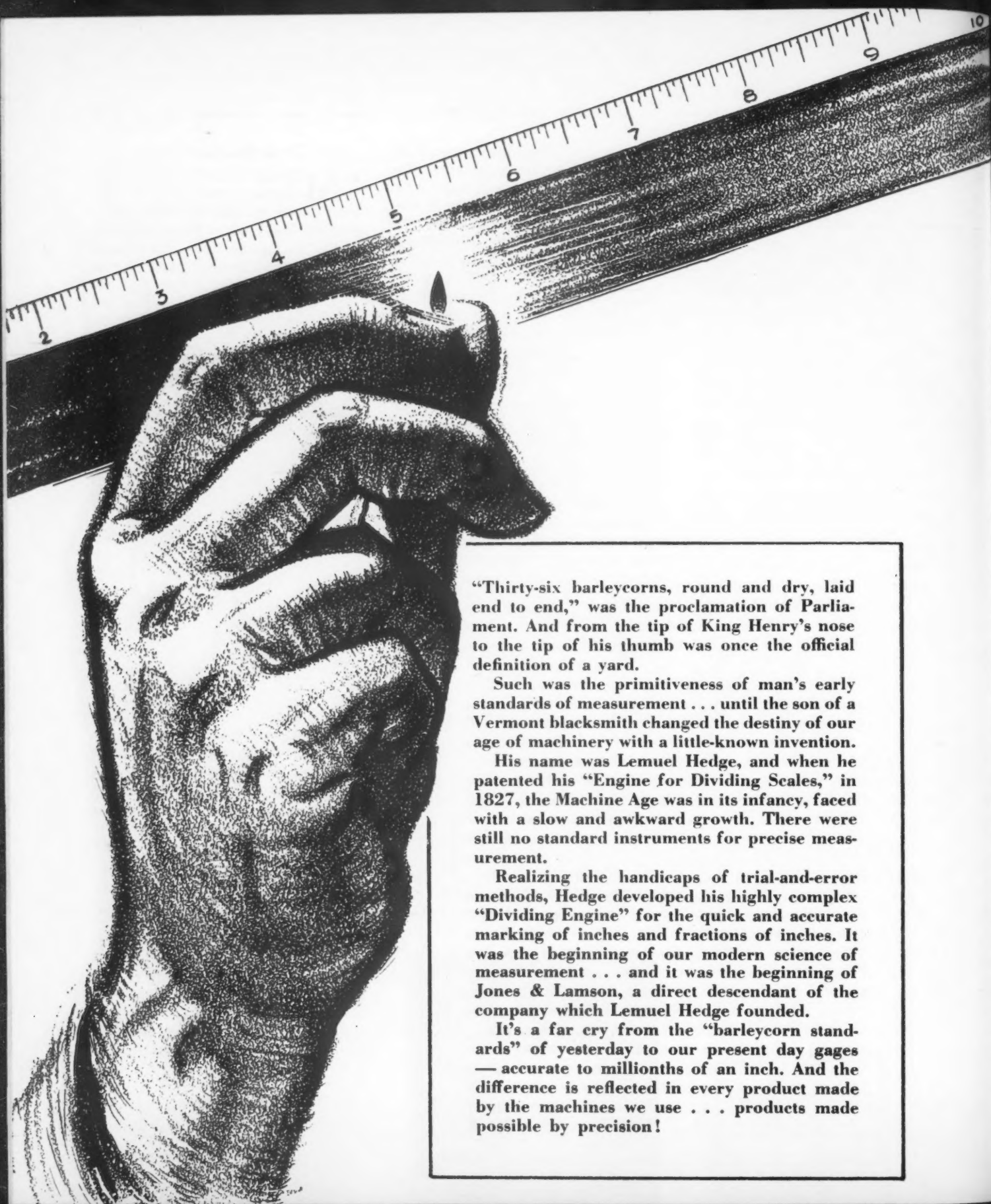


plant with very little effort and requires no extra equipment. These hoists are made in both a.c. and d.c. models.

Drum Cradles

INDUSTRIAL PRODUCTS CO., 2820 N. 4th Street, Philadelphia, has introduced a safety cradle for drums and barrels. Rotating wheels at the top of frame allow drums and barrels to be easily and quickly put into position for removing part of liquid or for draining. Wheels and swivel casters are large diameter, heavy duty type, so that the unit may be moved to desired location with comparative ease.





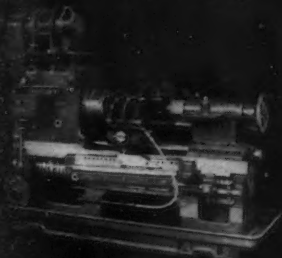
"Thirty-six barleycorns, round and dry, laid end to end," was the proclamation of Parliament. And from the tip of King Henry's nose to the tip of his thumb was once the official definition of a yard.

Such was the primitiveness of man's early standards of measurement . . . until the son of a Vermont blacksmith changed the destiny of our age of machinery with a little-known invention.

His name was Lemuel Hedge, and when he patented his "Engine for Dividing Scales," in 1827, the Machine Age was in its infancy, faced with a slow and awkward growth. There were still no standard instruments for precise measurement.

Realizing the handicaps of trial-and-error methods, Hedge developed his highly complex "Dividing Engine" for the quick and accurate marking of inches and fractions of inches. It was the beginning of our modern science of measurement . . . and it was the beginning of Jones & Lamson, a direct descendant of the company which Lemuel Hedge founded.

It's a far cry from the "barleycorn standards" of yesterday to our present day gages — accurate to millionths of an inch. And the difference is reflected in every product made by the machines we use . . . products made possible by precision!



FAY AUTOMATIC LATHES



AUTOMATIC THREAD GRINDERS



OPTICAL COMPARATORS



AUTOMATIC OPENING DIE HEADS

How many **BARLEYCORN**s make a **FOOT**?

Since the days of Lemuel Hedge, we, at Jones & Lamson, have maintained the highest standards of precision workmanship — have continually raised these standards for ourselves and others.

Twenty-two years ago Jones & Lamson pioneered a new method of gaging screw threads. It told, *at a glance, the complete story* of how a thread would fit its mating parts. This machine was the Jones & Lamson Optical Comparator. It was the first Optical Measuring and Inspection machine ever designed for practical shop

use. Constant research has revealed an unlimited field for Optical Inspection and Measurement. It will not only measure and inspect all screw threads and related parts, but it will measure and inspect many irregular forms that are difficult, or even impossible, to measure mechanically.

We invite any interested person to submit samples, or blueprints of parts, with tolerance to be checked — or Jones & Lamson representatives will study your inspection problems in your own plant.

JONES & LAMSON **MACHINE COMPANY**

Manufacturers of Ram & Saddle Type Universal Turret Lathes . . . Fay Automatic Lathes . . . Automatic Thread Grinding Machines . . . Comparators . . .
Automatic Opening Threading Dies and Chasers

Springfield, Vermont
U. S. A.



**PROFIT-PRODUCING
MACHINE TOOLS**



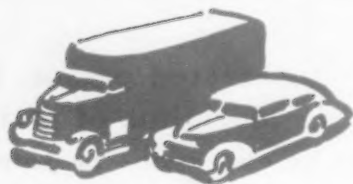
SADDLE TYPE
UNIVERSAL TURRET LATHE



RAM TYPE
UNIVERSAL TURRET LATHE

Assembly Line . . .

• Supply of machine tools shows signs of loosening, although large order banks are still on hand . . . Standard tank engine chosen . . . Detroit manpower regulated.



DETROIT—Quite definitely there are large order banks remaining in the books of the machine manufacturers, but the backlogs which in late 1941 extended a year or sometimes two years back have been importantly whittled in recent months, and in addition are today being reshuffled a great deal.

The sight of order banks diminishing to a six- or on eight-month level is obviously disturbing to companies which have become accustomed to thinking in terms of deliveries 12, 18 and even 24 months ahead. This may account for an unusual occurrence in one large producing company's offices during recent weeks—machine tool salesmen came to call, looking for business.

Naturally, two-year machinery backlogs could not go on forever, and it is inevitable that as the big war production programs move toward completion the need for additional manufacturing facilities would taper off, the record-breaking production volume of the past few years was bound ultimately to fulfill requirements.

Beyond that simple fact are other considerations which seem to be acting to bring many segments of the tight machine tool picture into flexibility a bit suddenly. Most important of these are the substantial cutbacks in ordnance requirements.

These cutbacks have made unnecessary many milling machines of various types, drilling machines, and some surface grinders. Some

broaches are also affected, as are certain shell lathes. A number of these types of machines can be retooled and set up for the aircraft work which has been so largely expanded. Whenever this can be done, of course, the need for additional aircraft production equipment is eliminated, followed by order cancellations.

BEYOND this factor, the production of certain types of milling machines and of radial drills has been steadily reaching toward the point where supply was coming into normal correlation with demand than has been the case in a long time.

On the other side of the picture, no easing is yet seen in demand for many types of machine tools. Multiple spindle machines exceeding tight since the war began, are still very hard to get. Internal and thread grinders, precision instruments of many kinds such as boring machines and some others are quite a way from being out of the woods.

A general key to the shape of the situation, however, lies in delivery schedules. Machinery buyers are finding this picture improving slowly but steadily. Some firms report that they are able to effect important machine tool deliveries within 60 days, armed, of course, with high priorities. But six

months ago priorities were of much less help in situations where the machines were simply not to be had.

The softening in the hitherto rigid picture may be temporarily overemphasized because of the blow dealt the shape of the production picture in the ordnance cutbacks. They are really big.

Maj. Gen. L. H. Campbell, chief of ordnance, outlined in Detroit this week the factors involved in deciding whose schedules should be chopped down. Inasmuch as these considerations might be taken to represent formal army policy in such matters, they may be worth pasting in executive hats. . . .

BIG companies and army arsenals took the largest cuts—ordnance bent backward to keep the little companies in business, because the small firms might be needed again and because "the small man is the backbone of the United States". Also, cutbacks were largest where labor supply was tightest, where transportation problems were worst, where power supply was the most strained, and where the firms involved had other work to keep them going.

Involved in the changed and reduced ordnance picture is standardization of engines used in medium tanks. One engine has been chosen for the majority of the tanks to be produced, although other types will continue in limited use.

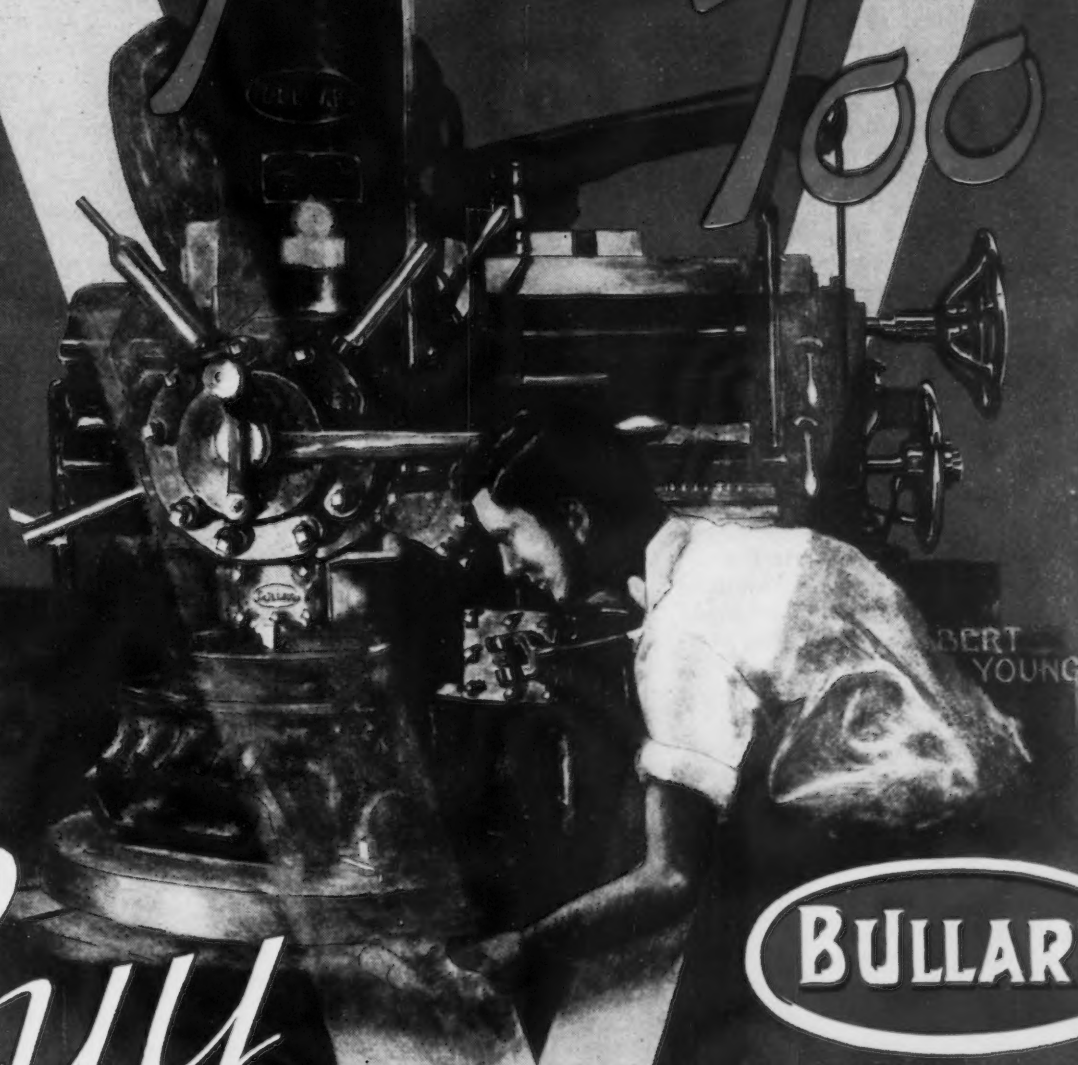
Engines which have been employed in tanks up to this time in-

FORD WILLOW RUN PLANT: These workers, shown grouped in front of a B-24 bomber wing section, have already cut 52½ hr. off their construction time on this unit. The huge sign which should carry their production record is left blank by the censors.

International News Photo



It's Your Fight Too!



BULLARD

Buy
UNITED STATES
WAR ★ BONDS

\$18.75 will buy:- one 81 millimeter trench mortar shell or 3 new bayonets or 10 rounds of anti-aircraft fire or enough fuel for one destroyer to search 37 miles for Nazi submarines.

clude both air-cooled and liquid-cooled types, as well as diesel jobs and probably all three types will remain in production. Interestingly enough, however, it does not appear that the engine which seems to have been decided on for most of the installations is one which has been in mass production up to this stage. It may be, therefore, that the production of this standardized engine will be pooled among a number of manufacturers.

But as matters stand today, the tooling problems of the ordnance program appear about in balance—which is not to say that changes may not come tomorrow which would unbalance the picture. But at least for the near term, it is quite apparent, production equipment requirements will come almost entirely from the air force and the navy.

One more consideration remains before concluding this outline of today's machine tool situation. It was mentioned by a large Detroit production plant that at the time many armament programs were planned, they were set up on a basis of use of high speed steel tools, planning caused in some instances by fear that carbide tools would not be available. Since then, however, carbide availability has surpassed many expectations, and switchovers have been made which permit increased speeds and feeds in production. Wherever such changeovers have come through, of course, the faster operation rates have tended to reduce the need for additional machinery.

Meanwhile, the tooling bottleneck is widening almost by the day. Delivery dates on gages, fixtures and jigs are being reported in the Detroit area as ranging on a general average from six to eight weeks against the 10-to-14 week promises which were customary for almost a year up to late autumn. And the shortened promises of today are being kept. Interesting, too, are statements from some tool chasers for large companies who report they are getting fairly welcome receptions in shops which a few months ago took on unhappy and glum looks when they walked in the door.

TODAY'S tooling situation may cast a bit of a shadow over the future of some of the tool companies which have expanded so rapidly in the past few years. In Detroit a general going rate for tool

work is said to be around \$4.00 an hour, although \$5.00 is still far from uncommon. Half of this is taken up at once in pay for the skilled workmen who man the machines. Out of the remaining \$2.00 an hour must come taxes, and fixed burdens on the shop equipment and the organization as a whole—burdens which seem disproportionate to \$4.00 an hour income. This cost situation can be over-ridden and turned into a profit margin with all machines in a shop operating full time, but as lags begin to develop and idle machine time begins to pile up, the ability of the shops to operate profitably becomes somewhat of a problem.

The spot news development of the week in Detroit was the announcement of the local war manpower commission of a plan to freeze 660,000 war workers in the area to their jobs. That announcement immediately started discussion whether the program "freezes" the men, "stabilizes" them, or merely outlines an approach to a point somewhere between those conditions.

On the committee which drafted the program over the past six weeks were representatives of leading companies and their trade associations, of leading unions, and of others. The announcement of a plan, therefore, can be taken to mean that it has the sponsorship of the divergent viewpoints of these groups. This is a surprise, for corporate heads have spoken in opposition to job freezing in recent weeks while they knew the program

which they finally approved was under discussion, and union leaders have been tacitly opposed also.

These background circumstances, then, stir up the question as to how far the plan actually goes in its job-freezing aspects. Another factor which might be in the picture is that the Detroit people may have figured that the situation was progressing to the point where some sort of arrangement was necessary if war production was to be held to its highest possible levels, and that it was better to draft a local program and make it operative than to wait for one out of Washington which might be less to Detroit's liking.

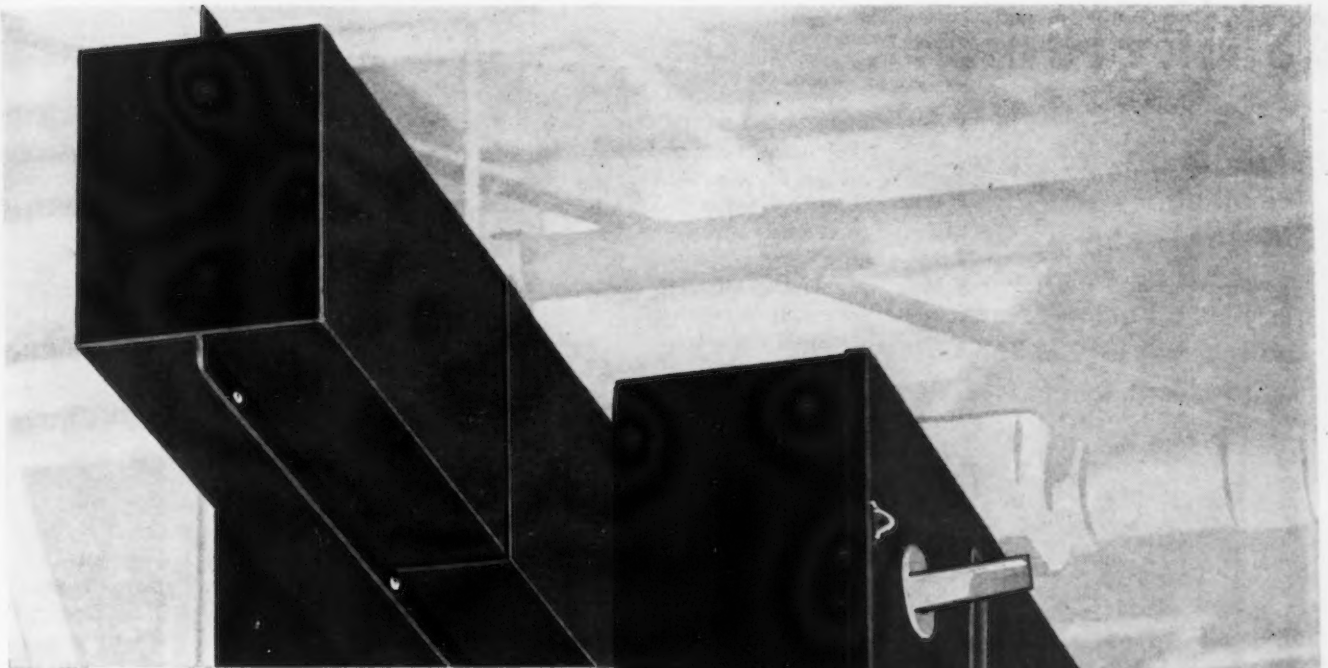
Employees in 34 industries are prevented from shifting from one job to another under the terms of the arrangement, unless reasons for the change are specifically approved by the manpower commission. Additionally, the United States employment service becomes more or less of a hiring czar, acting as the clearing house for such changes. It is notable that any workers authorized to shift jobs retain seniority in their original plants during their tenure away from those plants, a clause which does not appear in the Washington-developed agreements in force in Louisville, Baltimore and Buffalo.

How much fluidity there is in the job freezing provisions remains to be seen. A worker may move to other jobs if he can establish one of five points—that he is capable of performing work of higher skill than the current employer is willing or able to provide; that he is employed at less than full time for a substantial period; that the distance between his residence and his work place is unreasonably great in the light of restrictions on gasoline and tires; that he has compelling personal reasons for wishing a change; or that he is employed at wages or under working conditions substantially less favorable than those generally prevailing.

The "compelling personal reasons" clause would point to a loophole in the plan. Yet if a worker has to appear before U. S., E. S. or the war manpower commission to establish these reasons, the very weight of the red tape involved may make changing inexpedient and actually result in "freezing". Much of the effect of the plan, obviously, depends on the policy with which it is administered.

150 PER CENT FOR VICTORY: This young lady, employed in the Westinghouse Lamp Div., Bloomfield, N. J., regularly invests over half her wages in war bonds. She is Wanda Jendzul, 19, an assembler of flash light bulbs for the armed forces. When a war worker invests 50 per cent of her wages in war bonds as well as her time in the plant—that's being 150 per cent for Victory.





**Industry's
Prime Mover...**

HORSEPOWER

Through modern Bus Duct flows the electric power that has made possible the astonishing achievements of our war production plants.

These Plug-in Electrical Distribution Systems contribute to plant effectiveness and efficiency, *because:*

Little or No Maintenance required as Bus Duct employs no rubber or other insulating material that deteriorates or breaks down.

Greater Safety for personnel and property as well as protection *against sabotage* is assured by the all-enclosing Duct.

Adaptability to changes in assembly lines or conversion of products at any time is a unique feature and pronounced advantage of Bus Duct systems.

Critical Materials Conserved to the ultimate degree, consistent with sound engineering, in the latest VICTORY MODEL Bus Duct.

BUY MORE WAR BONDS • SALVAGE ALL SCRAP METAL

BULLDOG ELECTRIC PRODUCTS CO.

Detroit, Michigan

Bulldog Electric Products of
Canada, Ltd., Toronto, Ontario

Field Engineering Offices
in All Principal Cities



BULLDOG "PLUG-IN" SYSTEMS—THE ARTERIES THAT SUPPLY POWER AND LIGHT FOR WAR PRODUCTION

Washington . . .

• National salvage campaigns and drive by daily press seen eliminating scrap scarcity . . . Factory scrap will have to be "persuaded out."



WASHINGTON—With the iron and steel scrap situation measurably easier and industry approaching full dress production of war material, the hard pull over the hump of scarcity has been made. In no grade of scrap, say reports from trade circles, is there any particular pinch. In turnings and cast grades there is an evident surplus. Barring depletion of mill stocks and extensive closing down of dealers' yards due to a long, hard winter, the outlook for supplies of old material is bright.

This is in sharp contrast to the recent situation of alarm over a shortage of scrap. It is due in part to the national salvage campaigns conducted both by the government and the daily press that the improvement has set in. The drive for continued salvage work obviously is going to be kept up as it should be. There is no intention of relaxing into a fancied position of easy assurance that the problem has been licked. On the contrary collections need to be pressed and care given to proper conservation and distribution of tonnage just as there is need for further inventory leveling and distribution of carbon steel whose supply situation also has become more comfortable.

The outstanding reason for the improved scrap situation is the large scale output of war material. The conversion loss on such material is less than in peacetime but a greater tonnage of steel is being fabricated. Another reason for the

more satisfactory scrap position is the curtailment of Lend-Lease shipments of ingots and semi-finished steel to England. This has built up the home scrap tonnage considerably. Scrap consumers are now beginning to cash in on war material scrap. It is coming out freely. This so-called industrial scrap ordinarily amounts to about 40 per cent of the purchased scrap supplies.

IT is estimated that industrial scrap supplies in 1942 will be about the same as in 1941. The railroad scrap tonnage, however, is expected to drop from 4,000,000 to 3,000,000 tons. The difference will be in dealers' yards. There will be more this year as the result of the scrap drive.

Though the daily press conducted a magnificent nation-wide campaign, the drive actually was a disappointment from a point of tonnage. Dealers estimate that the collection from this drive actually totaled only about 2,500,000 tons rather than 6,000,000 tons as has been claimed. This household scrap also has the serious defect that it was light in character. In the trade it is called "fluff."

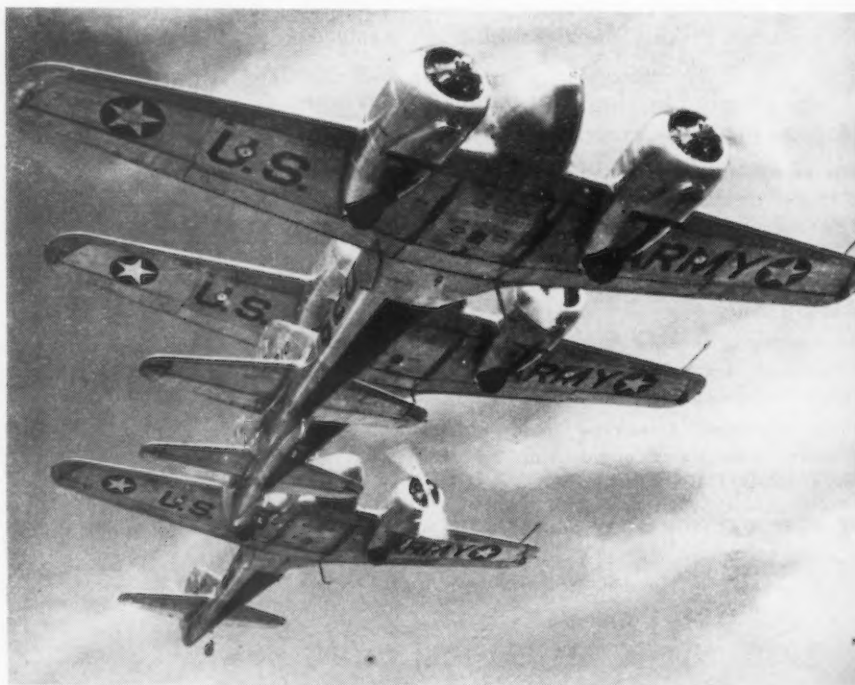
There also is disappointment that relatively little dormant scrap has been collected. There were some

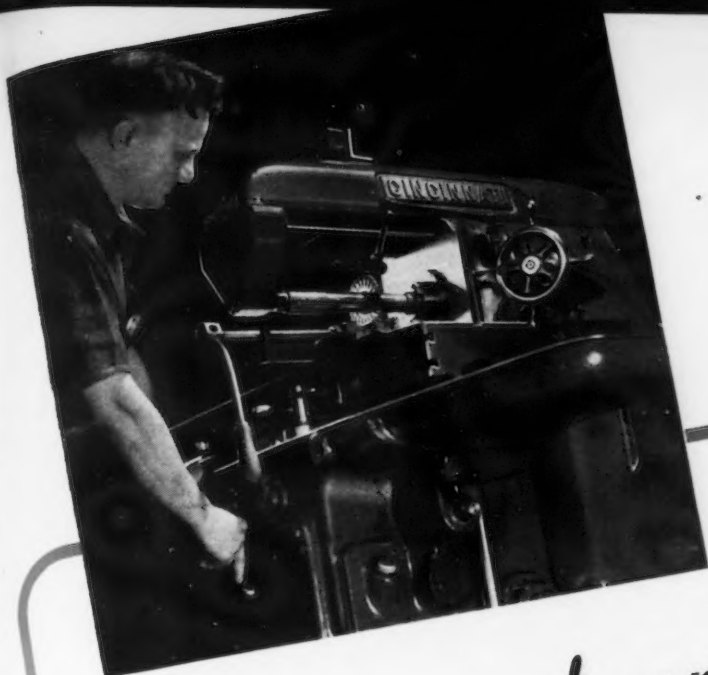
street car rails salvaged and a couple of ships were broken up but there has been no mine scrap, an important source, or any substantial collection of obsolete machinery or other kinds of dormant scrap. WPB has established a section to do this work, but the small salvage operations for the recovery of dormant and other high cost material is attributed partly to the curtailment of the authority of the War Materials, Inc. This organization was considered to have been ideally set up both as to functions and staff to gather scrap at above ceiling prices. Dormant scrap is thus only potential, though a fruitful source, and its collection must be financed by the Government. Contention also is made that more emphasis should have been placed on farm and industrial scrap.

As for factory scrap it will have to be "persuaded" out. Plant owners are wary about disposing of old equipment for fear that it cannot be replaced. But some success in persuasion is being achieved. The campaign to gather this scrap is being conducted by steel industry and steel warehouse salesmen by personal visits to plants. There is a yardstick to determine what old equipment to scrap. It should be junked, factory owners are being

ALMOST PICK-A-BACK: Fledgling pilots are shown here learning to fly the twin-engined Curtiss AT-9 in tight formation. This type of formation is credited with giving maximum protection against enemy air attack. These ships are considered transition trainers.

Press Assoc. Inc. Photo





He can set up the job
MORE QUICKLY...
...and take care of
MORE MACHINES

● Given a few weeks training, almost anyone can operate a machine, but setting-up the job requires several times as much experience. For this reason, the set-up time may often be a serious drag on production. One thing that can be done to help the situation is to install new machines which have quick and convenient set-up features, and, of course, the same or preferably greater productive capacity. One man can then take care of more machines, and there will be a smaller proportion of non-productive set-up time. Some set-up factors for a given machine—mounting the arbor in the spindle and clamping the fixture to the table—remain practically constant. Others depend upon design features. Those that vary are a matter of but a few minutes on the CINCINNATI No. 1-18 Plain Automatic Miller:

Changing feeds—pick-off gears—no wrench required.

Changing spindle speeds—pick-off-gears—no wrench required.

Adjusting spindle quill—lever clamp and handwheel—no wrench required.

Adjusting table and work to cutter—hand crank.

In the illustration, you see a typical job being milled on a CINCINNATI No. 1-18 Plain Automatic—a slot $\frac{3}{32}$ " wide, by $\frac{11}{16}$ " deep cut from the solid at $5\frac{3}{4}$ " per minute. Because of the convenient set-up features tabulated above and the productive capacity of these machines, you know that the job will be completed in a minimum of time. Circular No. M-848, listing all of the features of the CINCINNATI No. 1-18 Plain Automatic Milling Machines, may be obtained by writing to the address given below.



● CINCINNATI No. 1-18 Plain Automatic Milling Machine



THE CINCINNATI MILLING MACHINE CO. CINCINNATI, OHIO, U.S.A.

TOOL ROOM AND MANUFACTURING MILLING MACHINES... SURFACE BROACHING MACHINES... CUTTER SHARPENING MACHINES



International News Photo

STEEL AIRFIELD: This air base, used against the Japs in New Guinea, is one of the new, quickly laid fields made with steel mats. These mats are light and easy to lay yet will take the landing of these heavy transport planes safely. This is an American method which is now being widely copied by the enemy.

told, if it has not been used for six months and won't be used for six months.

LOOKING to the future there is a great deal of speculation concerning the effect on scrap needs as the result of the iron and steel expansion program. This program as finally approved by WPB provides for increasing the basic capacity of the steel industry by 10,000,000 ingot tons and an increase of 10,945,000 tons in the blast furnace capacity. A relatively small number of the new units have come

into operation. Most of the remaining units are scheduled to be in production by the middle of next year.

With this large blast furnace capacity added the question has been raised whether such an increment in pig iron tonnage will cut down sharply the demand for scrap by the substitution of a larger mixture of pig iron in steelmaking. There may be varying answers built upon certain conditions. One explanation that seems to carry weight is that on net balance the effect on scrap needs will be less than was at first commonly thought.

Those taking this view offer a few basic facts to support their reasoning. For one thing they point out that because they have been so hard-driven under pressure of war requirements, it is inevitable that before long many blast furnaces will have to be blown out for relining. While it is true that new furnaces likewise will be coming in blast, it is maintained that temporarily the loss in output due to blown out furnaces will be greater than the increased production from new furnaces. There are those, however, who think one factor will just about offset the other, or even that new capacity will exceed the loss.

In any event, it is further pointed out that while there will be a sharp bulge in pig iron capacity, it is to be kept in mind that, though 945,000 tons less, there is also to be a big increase in ingot capacity, calling for more scrap as well as pig iron. As is the case with blast furnaces, some hard-pressed open hearth furnaces are down for repairs while some new ones are coming into service. Another point made with respect to the effect of increased blast furnace capacity on scrap needs is that a source of greatly increased demand will be the enlarged electric furnace capacity, a 100 per cent scrap melter.

But whatever may be the effect of increased blast furnace capacity on demands, dealers say that they can make more money on a low market than on a high one because of less investment and a greater margin spread.

Oil Well Units Exempted

Washington

• • • Oil well pumping units were removed recently from the list of items in which the use of steel is prohibited by Conservation Order M-126 as amended, it was announced by WPB Dec. 8. This action was taken on the suggestion of Petroleum Administrator for War, Harold L. Ickes. The units, essential in the production of oil, must be made of either steel or high-grade wood. Manufacturers have been unable to obtain the type of lumber required. The amended order also makes it clear that closures as well as containers for certain listed products are prohibited. The order allows the use of steel in milk storage tanks until April 30, if other materials are not available.

THE BULL OF THE WOODS

BY J. R. WILLIAMS



Announcing

A Series of 6 TRAINING FILMS

For your use in the training of new men, apprentices,
and personnel being converted to war work
on DESIGN, BRAZING, APPLICATION, GRINDING
OF CARBIDE TOOLS

We announce—for use in your plant—a series of six training films covering the fundamentals of carbide tool manufacture, design, brazing, application and grinding. Based on more than a decade of experience in the art of cemented carbide use, the films are designed to speed the training of new men, apprentices, and those being converted to carbide tool use in the metal working industry. Also suitable as “refresher courses” for those with working knowledge of carbide tool use but who wish to review the latest techniques. Technically known as “film strips”—containing illustrations and explanatory text—these films are designed for step-by-step training in the following subjects:

SUBJECTS

Film No. 1—“WHAT IS CEMENTED CARBIDE?”

Designed to provide a knowledge of what cemented carbide is, physical characteristics, and how made. Valuable as a basis for understanding reasons for recommendations in subsequent films.

Film No. 2—“DESIGNING CARBOLOY TOOLS”

Reviews for tool designers, the special requirements necessary in designing tools with carbide tips. Covers tool styles, tip and shank sizes, rakes, etc., for single point tools.

Film No. 3—“BRAZING CARBOLOY TOOLS”

Detailed, step-by-step procedure for torch brazing carbide blanks to steel shanks. Includes brazing of single and multiple point tools, how to renew worn-out H.S.S. cutters with carbide tips, etc.

Film No. 4—“CHIP BREAKERS”

Shows how to determine most efficient chip breakers for carbide steel cutting tools; how to adjust to meet individual conditions; and step-by-step procedure for grinding rapidly and accurately.

Film No. 5—“GRINDING CARBOLOY TOOLS”

Step-by-step grinding procedure for single point carbide tools from brazed, damaged and ordinary dulled states. How to rough rapidly and finish accurately. Equipment, wheels, accessories.

Film No. 6—“PUTTING CARBOLOY TOOLS TO WORK”

Important for the operator applying carbide tools. In three parts: Part I—Putting tool on machine. Part II—The machine. Part III—Trouble shooting. What to do when the job doesn't “click”.

AVAILABLE FOR PERMANENT USE AT COST OF PRINTS ONLY

So that industrial concerns and educational institutions may incorporate these films as a permanent part of their war training program, prints are available for purchase at approximate print cost of \$20.00 for set of 6. (Entire cost of film production has been absorbed by Carboloy Company.) One complete set of six reference manuals and one instructor's manual included.

CARBOLOY COMPANY, INC., DETROIT, MICH.

(Sole makers of the Carboloy brand of cemented carbides)

Chicago • Cleveland • Los Angeles • Newark • Philadelphia • Pittsburgh

CARBOLOY CEMENTED CARBIDES

TRADEMARK

Not Motion Pictures

Carboloy training films are technical films known as “film strips”, or silent slide films (35mm), containing illustrations and explanatory text for detailed training purposes.

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Carboloy Company, Inc.
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☐ Send free booklet describing Carboloy Training Films.

☐ Reserve 1 set of 6 films @ \$20.00, including set of film reference manuals and instructor's manual. Order follows.

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Company _____

Company Address _____

City _____ State _____

WEST COAST . . .

• Stockpiles of iron and steel scrap may be located at strategic points in the West Coast and intermountain areas . . . Publicly owned scrap reported increasing rapidly . . . Shipments of demolition scrap also rising.



SAN FRANCISCO — Stockpiles of iron and steel scrap under Federal sponsorship may be located at strategic points in the West Coast and intermountain areas with the dual purpose of leveling off the flow of material to scrap yards and mills and providing for regular absorption of low grade public drive scrap along with high grade industrial material.

Choice of the far West as the guinea pig for such a plan, the grapevine from Washington, D. C., indicates, may logically be expected because of recent log-jams resulting from periodic arrivals of substantial quantities of demolition scrap from war areas. Availability of such high grade material also has prejudiced the processing and use of scrap material received in public drives. Inauguration of the stockpile plan, if it receives final approval, is expected very shortly.

Although an innovation for the steel industry, the plan is roughly similar to the system of hold-points which has been so successful in preventing railroad cars from bunching up at tidewater.

Publicly owned metal scrap, subject to allocation by the WPB iron and steel division, is increasing rapidly because of incoming shipments of demolition scrap at Pacific ports in cargo bottoms which otherwise would be empty. Substantial quantities also originate from the numerous shipyards where the Maritime Commission

holds title to material purchased by the Commission. Other publicly owned material includes quantities from Navy Yards and Army establishments and scrap from military contractors using Government furnished material.

If the stockpiles are established, decision must be made once again on the question which arises so often in connection with ferrous scrap: Should jurisdiction be given to the WPB Iron and Steel Division or to the scrap processors (the automobile graveyard) section of the WPB Conservation Division. Large quantities of scrap are being developed by the latter organization, and the special projects section, also a part of the Conservation Division, is a substantial supply factor. Furthermore, scrap contributed through the general salvage section of the Conservation Division in many cases has been donated rather than sold and is in public hands.

WHOEVER maps the strategy, the stockpile plan contemplates that all scrap should continue to be turned over to existing private yards for processing and segregation. At this point in the flow sheet, Uncle Sam would step in and place the material in public stockpiles, later to be allocated to consumers according to their needs.

Proposed stockpile sites include one in the Puget Sound area and others possibly at Portland, Spokane, and Nampa, Idaho in the Pacific Northwest. The San Francisco and Los Angeles industrial areas, at tidewater, and points in Arizona and Nevada, in the interior, would be logical Pacific Southwest locations. Shipments eastward to balance midwest stocks would be from Idaho, Nevada or Arizona stockpiles, thus eliminating cross hauling now resulting from shipments of remote inland scrap to the Coast mills and shipyard and demolition scrap hauled from Pacific tidewater to the Chicago district. Coast yards, now swamped when overseas scrap arrives simultaneously with shipments from remote interior points, also would be enabled to restore operations to an even keel.

Not conjecture, but certainty, is the payment by iron and steel scrap consumers of the 3 per

cent property transportation tax imposed under the 1942 Revenue Act. The Office of Price Administration has ruled that if sellers were required to absorb the tax, the resultant reduction in realization at the shipping point would tend to impede the free flow of scrap to consuming centers. The ruling has special significance in this section, where transportation costs are such a high proportion of delivered cost of remote scrap.

FIRMS and communities on the West Coast who owe their bread and butter to the aircraft industry don't like to consider that the time may come when they will be short on butter and possibly on bread, too; consequently, the subject is seldom discussed. Recently, however, Arjay Miller of San Francisco, whose business is statistical study for the Federal Reserve Bank, speaking as an individual, cold bloodedly discussed the subject without respect for Chamber of Commerce taboos.

With the same disregard for consequences as a chauffeur who drives the retreads over safety zone buttons, Mr. Miller logically cites as the distinguishing characteristic of West Coast manufacturing areas that they are experiencing boom times as a consequence of expansion of new industries rather than conversion of already existing facilities like their eastern brethren.

"This situation augurs badly for the period following the war," Mr. Miller deplores, "for a return to pre-war conditions in Pacific Coast areas would mean a net concentration of activities as opposed to a reconversion to normal peacetime operations."

This iconoclast then dissects the potential postwar demand for planes, an operation usually conducted by others with a notable disregard for scientific method. The reasons that, with demobilization of Axis air forces, mastery of the air can be maintained by a substantially smaller Allied air armada, and, because the enemy will not be trying to get ahead of the game with new models, technical obsolescence of our own planes will be minimized. With the experienced technique of a revival preacher conjuring visions of hell

FOSDICK

*"One of the best
of all the Radials we have"*



Put your Radial jobs on a Fosdick Hydraulic Radial and get these advantages and many more, resulting in greater production—precision work—low cost operation.

Bulletin Fosdick Hydraulic Radials RA gives complete details. Write for one.

• This statement from the foreman of a prominent manufacturer of Grinding Machines indicates the growing appreciation of Fosdick Hydraulic Radials by the men using them.

Here various operations are being performed on a total of 30 holes in a cast iron hand table traverse apron for a 10" Type C Hydraulic Cylindrical Grinding Machine at the rate of one piece per hour.

Two set ups are required of jig locating holes on four sides of the work and a clamp on work table handle the remainder.

Operations are as follows—

Drill and tap—11 holes $5/16"$ — $18 \times \frac{1}{8}"$
Tap 17 holes—other sizes standard thread
Tap 2 holes— $1/8"$ pipe thread
Ream 1 hole— $1"$ dia., 2 holes— $1/2"$ dia.
1 hole—drawback spot face
1 hole—spot face
5 holes—counterbore

After two years of constant operation under strenuous war conditions the foreman speaks of the following features as contributing to the success of this Fosdick Radial on their work. "Heavy, ball bearing spindle is very accurate—Centralized controls provide all necessary operating speeds—Large diameter column and arm section prevent deflection."

FOSDICK

MACHINE TOOL COMPANY

CINCINNATI • • • OHIO

and brimstone, Mr. Miller recalls that, following World War I, cancellation of orders totalling \$100,000,000 within a three day period following the Armistice, caused a total collapse of the aircraft industry. Equipped to produce 45,000 planes per year by the end of the war, manufacturers were called upon to make less than 3,000 planes in the five years that followed. As a final blow, the Army resold, from its war surplus, 1500 planes and parts sufficient to make 500 more. At this psychological point, Mr. Miller points out that following the present conflict, the Army and Navy will very likely have more planes than they know what to do with and consequently not be eager customers for more military aircraft.

Having thus killed off the industry's best cash customer, Mr. Miller uses statistical quicklime to disintegrate the conjecture that expanded commercial and private flying will become able substitutes as heavy buyers. For instance:

"Despite rapid progress, only 440 planes were in operation by all U. S. airlines at the beginning of 1941. The air transport industry still carries less than one per cent of the passengers traveling by rail, and all the air express carried in 1938 could be placed on a single train."

"... considerable attention is given to the possibility of sending all first class mail by plane... (this) would require a fleet of 10,000 transports."

"PLANES now on the drawing boards will be able to reduce costs of carrying passengers from the present level of 5c a passenger mile to around 2c... it is estimated that if all Pullman passengers took to the air, a fleet of 4,000 planes would be required."

"To date, the history of (cargo) planes is an account of great technical strides in the design of planes for which no market materialized. The old Ford trimotor which went into production in a new and model factory in Dearborn in 1930 was stopped the next year after only a hundred or so were completed. Ford, incidentally, lost some \$2,000,000 on his excursion into aviation. Only 30 or 40 of the old Fokker airplanes... were ever sold. Beginning in 1934, a number of big four-engine flying boats were manufactured by Martin, Sikorsky, and Boeing.

Only three Martin flying boats... less than a dozen Sikorsky's, and 10 Boeing Clippers were built. Boeing also sold 18 four-engine Stratoliners. In all, fewer than 200 (cargo) planes equipped with three or more engines have ever been sold."

Pointing out that in the post-war world, cargo transport must prove itself on the basis of competitive costs, Mr. Miller cites present air express rates averaging around 60c a ton mile, compared with average less than carload freight rate roughly 3½c a ton mile and ocean rates as low as 1/10 cent a ton mile. Possibly, after the war, airlines may be able to carry freight profitably for about five to ten cents a ton mile, Mr. Miller thinks.

He characterizes estimates that a fleet of 40,000 planes will be required to carry mail, passenger and cargo within a reasonable time after the war as "probably colored by the usual optimism with which the future of commercial aviation has been and still is regarded." Acknowledging an increase in de-

mand for private planes, this analyst makes no numerical estimates of demand. He is content to point out that "our manufacturing capacity is scheduled to reach... 125,000 planes annually by next year; and even under the most optimistic assumptions, it is hard to see how more than a fraction of this amount will be demanded" annually after the war.

Some hope is offered for the southern California aircraft industry, relative to that in other parts of the country, in the inevitable postwar contraction. Favorable climate, the fact that a larger proportion of wartime plant expansion there has been fathered by private capital than in the nation as a whole, and the fact that a number of the midwest aircraft factories are only branch assembly plants of Coast concerns are offered as saving factors. The possibility of the automobile industry continuing large scale aircraft manufacture is discounted. Closing the jaws of logic which he has fabricated, Mr. Miller concludes that a large number of southern California aircraft workers will be looking for jobs after the war. Inasmuch as close to 50 per cent of all factory workers in that area are employed at aircraft plants, the line will form early and be long.

Due to war production pressures, difficulties of transportation and complete absorption of facilities at the Hotel Del Monte for military purposes, tentative plans for the 19th Annual Pacific Coast Iron, Steel and Allied Industries Conference in February have been cancelled for the duration.

Instead, two California regional meetings will be held early in 1943. Central and northern California affiliates of the industry will be invited to join the Central Coast Conference of the Industrial Committee of the California State Chamber of Commerce to be held at the Palace Hotel, San Francisco, Jan. 22. There will be morning and afternoon sessions with a special noonday luncheon and address.

At Los Angeles, Feb. 18 a similar southern California district meeting under the same auspices will be held.

Howard M. Taylor, Taylor & Spotswood Co., is chairman of the postponed conference and Charles S. Knight, director industrial department, California State Chamber of Commerce is secretary.

WOMEN GUARD WAR PLANT: Two of the women guards who have been trained to take over much of the protection work at the new Allis-Chalmers supercharger plant here check the contents of a brief case carried by a visitor. Hired and trained as an experiment, the dozen feminine guards at the factory have proved successful. They've been instructed in the use of firearms and they'll shoot to kill if necessary.

Wide World Photos



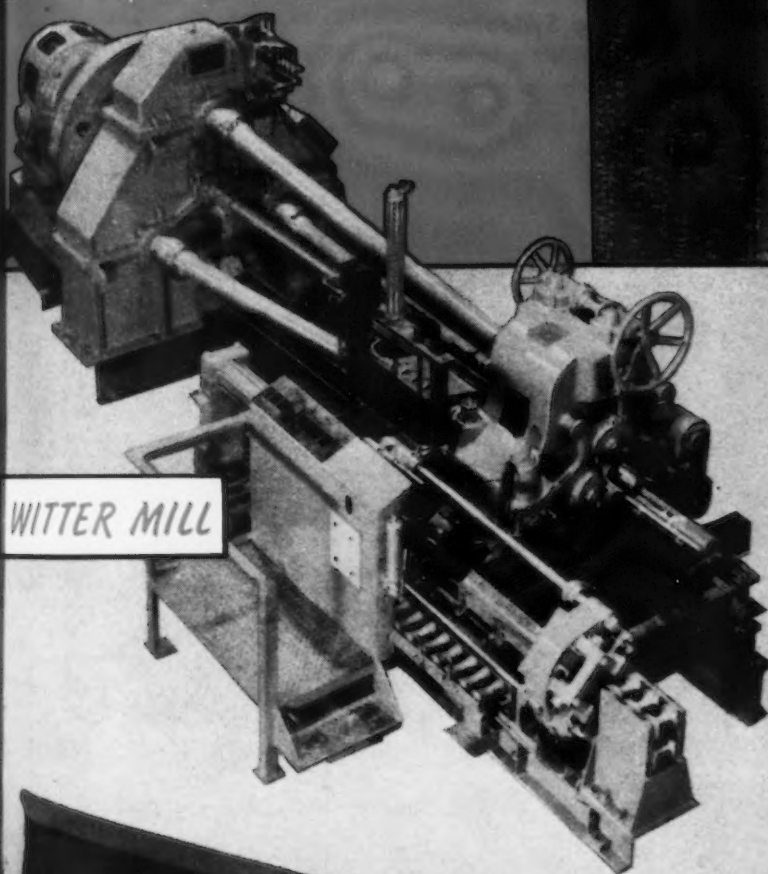
SAVES 20% IN MATERIALS WHILE IT TRIPLES SHELL FORGING PRODUCTION

ORDINARY PROCESS

4" square 10 $\frac{5}{8}$ " high
48 Lbs.

WITTER PROCESS

4 $\frac{1}{2}$ " square 6 $\frac{3}{8}$ " high
36 Lbs.



WITTER MILL



SALEM'S WITTER PROCESS

Illustrated above is an elongated forging as it leaves the Witter Mill. Note the smooth and uniform cavity.

105 mm. Billets

When the Witter process goes into operation, outstanding production schedules are bound to be maintained. This process starts with 20% smaller billets than those used for other methods, and they are heated in a rotary furnace to 2250°F. Next, the billets are pierced on an upsetter or press. And, without being reheated, these forgings are delivered to a Witter Mill which elongates and rolls the shells to finished forging dimensions. Since these measurements are closer to the size of the finished product than with other methods, far less material is cut away in the final machining operations. Hence, the Witter process saves many tons of steel as well as thousands of man hours. Write today.



SALEM ENGINEERING CO. . . SALEM, OHIO

Fatigue Cracks

BY A. H. DIX

Misplaced Zulus

On page 70 of the Dec. 3 issue is a picture of decorated welding masks. The caption links Zulus and the South Sea Islands. Purely for the sake of accurate reporting, don't Zulus live in the south central part of Africa?

—R. W. Weesner,
Wilson-Weesner-Wilkinson Co.,
Nashville, Tenn.

A mere typographical error. We meant Sulus. Any of our caption writers can tell you at the drop of a hat that Zululand, 10,424 sq. mi., was a province of Natal, Union of South Africa, until Dec. 30, 1897, when it was annexed to Natal.

The one that fools us is Patagonia. Does Mr. Weesner know in what continent that is?

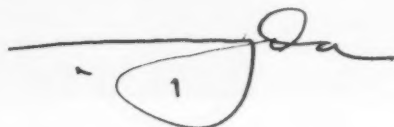
He Couldn't Sleep

• • • You saw something you could use in say that Linde Air Products adv. of a couple of weeks ago on how to make welding and cutting regulators last longer. You intended to clip it, but didn't. And now wish you had. To find it do you have to go through one issue after another? No. You simply turn to the Advertisers' Index on page 209, run your finger down the L's, and there it is—it was in the issue of Nov. 26.

This brand new, amplified index tells you in what issue every advertiser of the last two months had his most recent adv. We lie awake nights thinking of ways to make life easier for you. The insomniac in this instance was the advertising staff's Henry Elcox Leonard, whose brainchild we figure will save the industry roughly a million man hours a year. We get it by multiplying 100,000 readers (a rough guess) by 10 minutes a week (another rough guess). It comes out exactly 866,666 2/3 hours, but we like round numbers.

New High in Illegibility

It seems to me that a friend of mine, who is with Fisher Aircraft in Cleveland, strikes a pretty good low in illegibility:



If you study it carefully, and if the stenographer has typed it in the lower left corner of the letter, you will see that it spells L. L. Lyda.

—L. B. (Bethlehem Steel) Shapleigh

B's in Bunches

• • • Alliteration is rife this week, with Wilson-Weesner-Wilkinson, and L. L. Lyda. Which reminds us to mention that four of the brains department's editorial assistants are the Mlles. Butzner, Barmasel, Benedetto, and Butters.

The Greek Prof Had a Word for It

Your pontification on hard-to-pronounce trade names is bilge. How about Prophylactic? It's long, hard to pronounce—and successful. In the same class is *Sozodont*, once a famous tooth wash, derived from Greek words meaning "save the teeth." I know because it was originated by my old Greek professor at, of all places, Colgate.

Speaking of names, what a friend of mine recently remarked Gutzon Borglum sounds like you wouldn't print.

—Deac

Prophylactic is long, but easy to pronounce. In fact, it can hardly be mispronounced. Both *proe* and *proff* are right, and the accenting comes natural, like eating. But apparently *Sozodont* was bought only by those who could read Greek. Any manufacturer who lets an old Greek professor pick out a name for a fang cleaner

to be sold to the general public deserves to have people ask for a can of Dr. Lyon's tooth powder.

Aptronyms

• • • We are a monolingual people. Therefore, we will not accept as an aptronym Walter P. Garrick's entry of a New York City smoke stack manufacturer named Rauch, which means *smoke* in German. Nor are we impressed with his other candidate—a Chicago funeral director named Skelton.

The only good one that has come in recently is from W. E. Christison, who writes that a Los Angeles dealer in blank legal forms is named C. A. Law.

We wish that H. E. Whetstone, of Gen. Motors' Chevrolet-Oakland Div., Oakland, Calif., worked for Norton or Carborundum.

Singing Syllables

• • • A letter came in the other day from J. F. Poe, of Omph, W. Va., which is now our favorite municipal monicker.

The most impressive personal name we have seen recently belongs to the writer of the foreword in a new book, "Patents for Hitler." The name is Creekmore Fath, which makes us think of a lisping furniture salesman trying to talk a customer out of buying a cheap rocker.

Gusher and Dribble

• • • A Sheffield, England, manufacturer tosses this \$5 chrysanthemum at our pres. and ed.'s editorials, "We read your editorials with considerable pleasure," and presents this page with this carefully calibrated compliment—"usually quite intriguing."

It used to be that we could get considerable satisfaction out of an English "quite," believing it to mean "entirely," instead of "barely," as it does in this country. But its use with "usually" makes us think that either the English have changed or the Sheffielder spent much time in the States.

Booklet of Editorials Ready

• • • The new booklet of editorials by John H. Van Deventer is now ready. It contains the cream of the '42 crop—"The Empty Chair," "Robbing Peter, Cheating Paul," "Can You Save 30 Seconds a Day," "Business After the War," "Devil Take the Little Fellow," and 24 others that have been in heavy demand. Twenty-five cents in stamps, sent to us at 100 E. 42nd St., N. Y., will get you a copy.

Stoppers

Making the Enemy Die for His Country—Vickers, Inc.

The Road to "Kamerad" is Paved with Scrap—Ohio Seamless Tube Co.

Puzzles

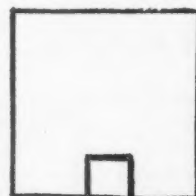
The volume generated by last week's revolving 1-ft. cube is 3134.2453 cu. in. If you would like to know the shape we will be glad to send you Lt. Com. Simpson's solution.

Solutions to the Nov. 26 circle problem continue to trickle in. Latest successful solvers are W. C. Marshall, Austen C. Fairbanks, Fernand Moreau, Jr., and O. Gruenberger.

Wm. H. Griffiths says that the probability of success in finding at least one matching pair when two 52-card packs are turned over, card by card, is 53/104. The formula is N plus 1. But, he explains, this works only with packs of

2N

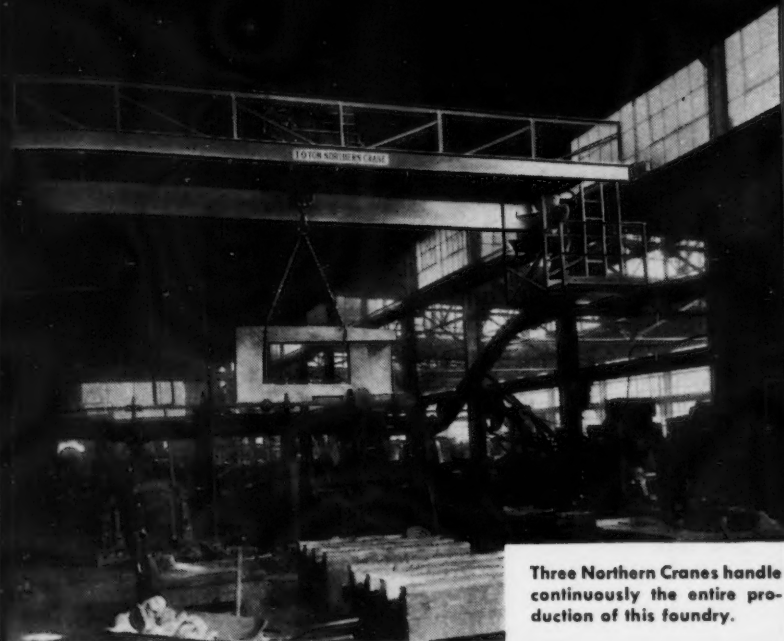
3 cards or more. He adds, "The original expression which I wish somebody else would replace by one which holds for N equals 1, N equals 2, and so on up, is:



$$N! \left[(N-1)! + \frac{(N-1)!}{2} (N-1) \right]$$

$(N!)^2$

R. L. Farabaugh sends this in:
The figure represents both the top view and the front view. Draw the side view.



Three Northern Cranes handle continuously the entire production of this foundry.

Typical Installations of *Northern* SUPER- CRANES



Two of twelve heavy duty Northern Cranes in this plant.

The proof of a machine is the service it gives. Northern Super Cranes are giving excellent service in every type of industry. Users will assure you that these Cranes are not only outstanding in performance, but are economical in operating and maintenance costs, capable of handling extreme overloads, and continuously on the job. We'll send you a list of users if you ask.



High speed general handling crane in electrical manufacturing plant.

NORTHERN ENGINEERING WORKS

2607 Alwater Street

Detroit, Michigan

Dear Editor:

BORON

Sir:

I was very much interested to read your excellent article on Boron in the Nov. 19 issue, and wonder whether you could let me have half a dozen reprints of this so that I may forward them direct to various people whom I know to be interested in this subject in the United Kingdom, where the conservation of critical alloys in steel is continually studied.

F. H. SANITER
British Raw Materials Mission,
Washington, D. C.

Sir:

In your issue of November 19 there was a very interesting article on Boron. Would it be possible to obtain a few reprints?

HARRIS K. MASTERS
Molybdenum Corp. of America,
New York City

Sir:

Please send us at your earliest convenience two copies of the article "Boron" by T. W. Lippert in the Nov. 19 issue.

A. S. JAMESON,
Works Metallurgist
International Harvester Co.,
Chicago, Ill.

• Because of the heavy demand for this article, reprints have been made. No charge for half a dozen or so copies.—Ed.

TOOL MAKERS IN UNIFORM

Sir:

I was approached a few days ago by the owner of a plant doing 100 per cent war work. He told me, "Some of our best men are now being inducted into the Army and I'm having serious difficulty in making delivery."

I went along with the plant owner for a first-hand look at the plant and conditions. I found that, for instance, after a year of waiting for a high-priced drill jig borer, it was installed and used only a few days and is now standing idle because there was only one man in the organization skillful enough to run it properly, and that man has been taken away from him and put into the Army.

It takes many years to develop a first class toolmaker, much longer than to develop a soldier. The above machine shop owner, for instance, is in a class by himself in his own plant. He has been in the business for many years and has employed many men. He has done his best as a teacher, trying to make his employees as skillful as he himself is. He has succeeded in many directions, but he has never been able to impart to anyone

his own uncanny ability at precision grinding. His skill at grinding and the rapidity with which he does the work is amazing. Nobody in his plant can "touch" him, as his employees themselves admit. And this owner is nearly 60 years old!

A first class toolmaker can do much more toward winning this war by being kept busily engaged at toolmaking. No doubt these men will also make first class soldiers, but soldiers need machinery and ammunition.

J. H. SQUIRES
Newark, N. J.

HYDROGEN FLAME WELDING

• "Tool Conservation in the Navy," is the title of an article in the Aug. 28 issue of THE IRON AGE. In this article is mentioned the fact that the Navy uses atomic hydrogen welding to salvage high speed steel cutters, building up worn cutters and welding broken ones.

In the "Dear Editor" page of Nov. 26 issue an inquiry from a reader, asking where atomic hydrogen welding equipment could be obtained, was answered thus:

"General Electric Co., Schenectady, N. Y., is sole manufacturer of atomic hydrogen welding equipment."

We are now informed by Electric Arc, Inc., 152-162 and 218 Jelliff Ave., Newark, N. J., that it manufactures a similar apparatus under the name, "Hydrogen Flame Arc Welding Equipment."—Ed.

DIMENSIONAL CONTROL

Sir:

Your Sept. 3 issue has an article entitled, "Foolproof Gaging System" developed by Army Ordnance. We are interested in receiving a reprint. In addition, we are desirous of more detailed information re dimensional control as employed by the U. S. Army Ordnance and any literature issued by it.

O. J. MOEHLER
Conmar Products Corp.,
Newark, N. J.

• We do not believe that the Ordnance Department has issued in printed form anything that goes beyond the facts given in our article, "Foolproof Gaging System." For specific information we suggest you get in touch with your nearest local ordnance district, which in your case is the New York Ordnance District Office, 80 Broadway, New York City. The entire inspection program is under the supervision of Col. H. B. Hambleton, Office of Chief of Ordnance, Washington, D. C. But, we doubt that he has anything in printed

form on dimensional control. You might find something useful in a booklet entitled, "Dimensional Control" issued by the Sheffield Corp., Dayton, Ohio.—Ed.

CEILING PRICE MANUAL

Sir:

The material contained in your Price Manual is excellent and will be of invaluable assistance to me in my work.

I know that several of the iron and steel price specialists in our other offices are using your manual also.

I certainly hope you will be able to continue your work in keeping your manual up to date.

A. J. WISE, JR.,
Price Section
Office of Price Administration,
Pittsburgh, Pa.

• The Price Manual (20 pages) was issued last February. An 8-page supplement issued later gave revisions and additions up to May 10. Subsequent changes have been reported each week in THE IRON AGE but have not been brought out in booklet form. Whether or not a new edition of the Price Manual is issued by us depends on the manifestation of an adequate demand.—Ed.

AIRCRAFT SHEET METAL PARTS

Sir:

In your June 11 and June 18, 1942, issues you published articles on the forming of metals over a time with the use of pad rubber and hydraulic press.

I was advised by Mr. Stoltz, a field man for Boeing Aircraft, that I could get a transcript of the above mentioned article by writing to you. I am foreman of the pattern and wood-working shop of the U. S. Army Air Corps, 77th Sub Depot, at Geiger Field, Wash. I worked for Boeing Aircraft for almost three years in their woodshop. We made the form blocks and dies used in all hydro press work. As we have repair work of aircraft, it would be much to our advantage, if we could secure all available information on such work. We have a small hydraulic press and can make a lot of replacement parts quicker than they can be purchased for us.

CLARENCE J. MCGOVNEY
Spokane, Washington

• These two articles are half of a four-part series that began in the May 28 issue which has been reprinted to form a 24-page booklet entitled, "Making Aircraft Sheet Metal Parts." A copy is being mailed.—Ed.

BRAZING H. S. STEEL TIPS

Sir:

Will you please send me two clippings of the article, "Two Methods of Brazing High Speed Steel Tips," which appeared in the Nov. 19 issue.

GEORGE T. FARROW
Scott & Williams,
Laconia, N. H.

How Monarch delivers a mile of Lathes per month



The exact number is a military secret. But if you use the old method of placing them "end to end," they'll stretch out a mile, almost any month. And they're all going into the fight for Victory.

Our production in 1942 is double that of 1941. For this, which are listed briefly at the right, if you can use our experience to increase your production, we are anxious to share it. We have no secrets about anything that will help bring Victory faster.

MONARCH LATHES
COVER THE TURNING FIELD

Below are some of the more important moves we made, many of them long before Pearl Harbor, to produce Monarch lathes faster:

1. Simplified line with fewer sizes—concentration on sizes and types most needed in War production.
2. Redesign of unit parts—to permit faster production, and to reduce quantities of critical materials.
3. Better job analysis—intensive study of every part, to turn it out the fastest way with existing equipment.
4. Expanded plant facilities—more space, more machine tools, but a relatively low percentage when compared to our rate of production increase.
5. Better tooling—to fit the job, and with almost 100% use of tungsten carbide tools.
6. Better plant layout—to avoid back tracking, useless handling of materials and processed parts.
7. Reduced "waiting time" for materials by careful scheduling, which also reduces inventories on critical materials.
8. Superior training—continuous classes to develop competent supervisors needed to guide heavy influx of new workers.
9. Institute school—for every new man and woman employed, in which they are observed, trained and then placed where they will be most useful.
10. Three balanced shifts—with 7-day operation to get the most production out of every machine in our plant.
11. Loyalty and patriotism of every employee, who knows the lathes they build turn out implements and munitions for Victory. They know this is their fight, too, and they're doing the job.

Realizing the value of time, we have sacrificed everything to it, except one basic principle. There shall be no let-down in the quality and accuracy of Monarch lathes. For this means only ultimate waste instead of saving.



First two-star Navy "E" pennant to be awarded in Ohio files from the Monarch plant. We're justly proud of this flag—earned by the loyalty and hard work of every Monarch employee. Some of the means we used to increase production are listed in this reprint of a recently published advertisement.

THE MONARCH MACHINE TOOL COMPANY . . . SIDNEY • OHIO

We'll build 'em . . . you use 'em!

Monarch men and women take seriously the award of this second star for their Navy "E" pennant. When they were first honored with the original pennant, in November 1941, they pledged themselves to continue to merit the confidence placed in them. And they've lived up to this pledge.

Today, they say to Monarch users, more earnestly than ever before—"We'll build them . . . you use them." Even with the amazing increase in the

number of Monarchs built this year, they'll stand up and take as much work as you can feed into them. Keep them turning day and night—they won't let you down.

You'll find, too, that these Monarchs are versatile. They'll do many jobs that ordinarily are not turned on engine lathes. If you are stumped with turning jobs, our field engineers can help you.

And back here at Sidney, we'll continue to build them, faster for fighters!

THE MONARCH MACHINE TOOL COMPANY . . . SIDNEY • OHIO

MONARCH LATHES



COVER THE TURNING FIELD

This Industrial Week . . .

- **Batcheller Reorganizes WPB Steel Division**
- **Search Starts for Experts on CMP**
- **Steel Operations Again Hold at 99.5 Per Cent**
- **Cold Weather Hampers Scrap Movement**
- **Draft Pressure Grows On "Under 38" Workers**

ONE of industry's biggest jobs this winter will be learning about the Controlled Materials Plan. When industry learns how to operate under CMP, the war production program will have taken another long step forward.

Experts in explaining CMP are not easily found. In the steel, automotive-aircraft and other industries they will have to be made almost overnight. WPB itself is hunting for men who can understand CMP.

At Washington the United States Civil Service Commission announced it is conducting a "Nation-wide search" for specialists needed in administering CMP for the WPB. This suggests that in time a man who can explain CMP will be almost as valuable to the war program as a machine tool operator.

Dissatisfaction following selection of CMP over other distribution plans has died down to a degree although some plant operators, particularly in Detroit, still are grouching about it. They claim CMP makes things easier for the metal producers; tough for the war program consumers.

Meanwhile WPB's Iron and Steel Division (formerly the Iron and Steel Branch) has been reorganized to give the green light to the Controlled Materials Plan which, industry hopes, will work so well in getting the right materials—steel, aluminum and copper at first—to the right war plants that the war effort will be speeded and the priorities system (this will take time) can be forgotten.

H. G. Batcheller, Allegheny-Ludlum Steel Corp. president who heads the WPB Steel Division is giving the division a thorough going over in an effort to streamline it for CMP. Few government agencies can contribute as much to the war effort as Batcheller's since, as everyone knows by now, this is as much a war of steel as of ideas and men. •

SETUP of the revitalized Steel Division is worth some study. The division has been set up in 12 main operating branches supervised by four assistant division directors: Miles K. Smith, F. E. Vigor, D. F. Austin and Norman F. Foy. New functions delegated to the division will be carried out by the Ferro-Alloys and Program Distribution Control Branches, including a Requirements Committee.

Apparently labor will get a greater voice in division affairs when a new Labor Advisory Committee is appointed. The Steel Distribution Committee and Distressed Stock Unit have had their names changed to

the Production Directive Committee and the Steel Recovery Branch.

Mr. Batcheller has six special assistants, including Alex. C. Brown, deputy director; J. A. Clauss, A. O. Fulton, G. G. Johnson, Clark M. King, C. Sterry Long and H. J. Ruttenberg, plus an army of trained steel men on branches of the division and on the Iron and Steel Industry Advisory Committees.

This week WPB officials repeated their warnings that there is little hope for steel in the near future for such consumer items as washing machines, vacuum cleaners and refrigerators. When the steel supply does become easier, first industries to get consideration will be indirect military users such as railroads.

Messrs. Batcheller and Foy told THE IRON AGE that some cancellation of steel orders in November was in part caused by the Army ordnance department's readjustment of its procurement program, plus cancellation of orders anticipating CMP.

Any slight increase in steel ingot inventory because of unbalance in the distribution picture have already been cleaned up, according to reports to THE IRON AGE. One plant which has been working exclusively on ingots for Lend-Lease has maintained the same output with the WPB finding outlets for the steel. Evidence gathered in the last few days suggests that steel backlogs again are edging upward for some companies.

STEEL ingot production in the U. S. remains unchanged at 99.5 per cent of capacity for the fourth successive week. Cincinnati district steel operations made the week's sharpest gain of four points to 109 per cent. Other advances in melting schedules include the Eastern area, up one and a half points to 107 per cent, Philadelphia, one point to 94 per cent, and Cleveland, a half point to 98 per cent.

Chicago district steel operations have sagged a point to 100 per cent, the lowest since mid-August. The large Pittsburgh district continues melting at 100.5 per cent. Detroit dropped 3 points to 104.5 per cent. Other important steel-making areas report unchanged operations, with Youngstown staying at 99.5 per cent; Buffalo, 104.5 per cent; Wheeling, 91 per cent; Birmingham, 98 per cent; and St. Louis, 107.5 per cent.

Severe weather in some sections of the country has slowed the movement of iron and steel scrap, while dealers and consumers continue to suffer from the labor shortage. In some areas scrap yard operators

are unable to hold employees for any length of time because of more attractive pay offered in war plants. OPA price ceilings prevent the scrap industry from meeting high wage rates paid in some other industries.

This week West Coast industry was discussing possibilities that stockpiles of iron and steel scrap under government sponsorship may be located at strategic points in the coast and intermountain areas to level off the flow of scrap and provide for regular absorption of low grade public drive scrap along with higher grade industrial material.

SHIPPERs of iron ore have contributed a share to the war industry's recent record-setting. During the past 254 days, the lake shipping season, a total of 92,076,781 gross tons of iron ore have been shipped from upper Lake ports (including 91,603,910 tons from U. S. ports and 472,871 from Canadian ports). During December, 635,929 tons of ore were shipped from U. S. ports, compared with 822,998 tons shipped in the corresponding month of 1941, when the shipping season lasted until mid-December. This year ore shipments ended during the second week of December because of sub-zero temperatures in the upper Lake regions and squalls throughout the Lake areas. Ore shipments this season were 11,980,421 tons or 1.49 per cent greater than in the 1941 season.

While steel plant labor shortage has not been reported from many areas, some steel companies are now advertising for unskilled men. By excepting men over 38 from the draft, the Army has forced itself to take more younger men, many of whom are in industrial training courses learning new crafts.

Surveying four steel plants employing approximately 180,000 men, THE IRON AGE has learned that 30,000, or 16.7 per cent, are now in the armed services. One of the four companies, however, has lost 20 per cent of its men.

One result of rejecting men over 38 for combat service will be a greatly accelerated movement to use women to replace younger war workers who are likely to be drained off into the Army.

IN most war production areas, labor continues to occupy the No. 1 spot in the headache parade. The job freezing plan announced in Detroit last week, applying to almost every worker in that area, will be carried through in a form applicable to the greater Cleveland's peculiar manpower problem under direction of the War Manpower Commission Labor-Management Committee.

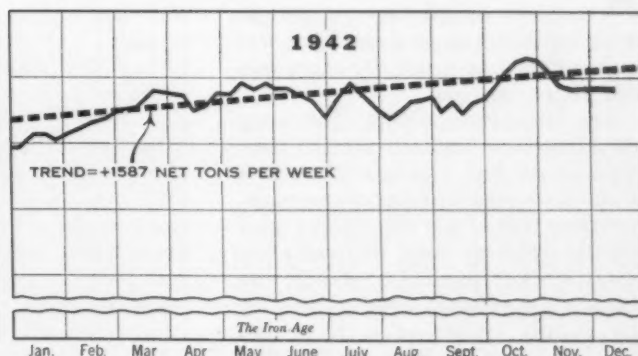
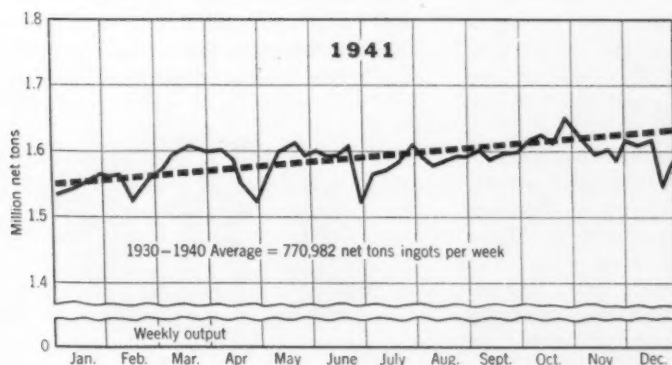
Cleveland's Labor Committee will decide what war industry operations are most essential and which ones face a shortage. War contract employers there will then be asked to sign agreements not to take on men in the essential categories unless they can show a certificate of separation obtained from their last job or through the U. S. Employment Service. This will not only prevent pirating of labor, but will also stop job shopping by skilled workers. The procedure is now being launched in the Warren-Niles, Ohio, area and has been carried through on a broad scale in Louisville, Ky.

BENJAMIN F. FAIRLESS, JR., president, and Irving S. Olds, chairman, of U. S. Steel Corp., last week summed up the labor shortage of their company this way: "At the present the manpower situation has not affected steel production; we do have some serious problems ahead. We have many workmen who are putting in 48 hr. a week or more. We have some working six and seven days a week. On the other hand, some workmen at plants making restricted products such as tin plate, are not getting more than three days a week, which cuts down the general average."

At Chicago it was indicated that "Katie the Crane-man" may soon take her place in war work with "Rosy the Riveter." Test training of women crane operators at a U. S. Steel plant in Chicago area have been successful, the company reports.

Mr. Fairless, answering questions in a give and take press interview at Pittsburgh, did not duck the controversial ones. Nor did Mr. Olds. (See page 100 for a complete report of the Olds-Fairless interview which followed the first meeting of U. S. Steel Corp. directors ever held in Pittsburgh.)

The Iron Age



Steel Ingot Production by Districts Per Cent of Capacity

Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	Ohio River	West	St. Louis	East	Aggregate
December 10	100.5	101.0	99.5	93.0	97.5	104.5	91.0	98.0	107.5*	105.0	102.0	107.5	105.5	99.5
December 17	100.5	100.0	99.5	94.0	98.0	104.5	91.0	98.0	104.5	109.0	102.0	107.5	107.0	99.5

* Revised



OEM Photo by Palmer

Steel Man with a Mission

.. TO KEEP THE ELECTRIC FURNACES MELTING

ALL of us—men or women—on the job or off it—are people with a mission these days. This war makes common cause for every one and spares no one.

The maintenance-man's job, atop an Allegheny Ludlum electric furnace, is no less essential than that of the crew who operate the furnace, nor than that of the fabricators who use the stainless, tool, valve or electrical steel it produces. Total war demands maximum cooperation on the supply fronts as well as the fighting fronts, and it asks also that every last bit of manpower and materials be used to maximum advantage.

Boiled down to a very few words,

that simply means: *no waste—everybody help*. How can we help you to produce better and faster for war; to stop the loopholes of waste; and to plan your course in post-war production?

For your designers and technicians, complete and certified laboratory data on all Allegheny Ludlum alloy steels are available in "Blue Sheet" form. For your engineers and production men, our "Handbook of Special Steels" contains comprehensive and valuable information; and our "Elementary Discussions," covering Tool and Stainless Steels were developed particularly for training course and student use.

Write for any printed material that will help you; and if you need personal assistance, the services of our Technical Staff are at your command.



Allegheny Ludlum
STEEL CORPORATION

PITTSBURGH, PENNSYLVANIA

A-8711 . . . W & D

News of Industry

CLARIFYING CMP: How it Affects Steel Producers, Fabricators and Warehouses

By NEELE E. STEARNS

Manager, Department of Business Procedures, Inland Steel Co.

• • • After approximately two years during which the priorities system has progressed through a series of complicated stages in an effort to distribute effectively the nation's scarce raw materials, we are about to commence another control procedure which involves the complete allocation of the available supply of certain materials for which the demand is greater than the supply.

This new method for controlling the distribution of raw materials is identified by the letters "CMP," which represent the Controlled Materials Plan.

For clarity in describing CMP, this report will be divided into three separate sections:

Causes and purposes of CMP.

Organization plan and procedure under CMP.

How will CMP affect primary and secondary consumers, warehouses and steel producers.

Causes and Purposes of CMP

Referring to the factors leading to the development of CMP, it can be said that we have reached the stage of all-out war production where our most significant problem is involved in getting limited supplies of raw materials to war plants in the proper quantities and at the right time so that these plants can produce on schedule the maximum quantities of war equipment needed at any given time. The Controlled Materials Plan is designed to accomplish this objective.

This statement might be challenged by asking whether we haven't been doing exactly this all along. The answer is that we have not. The achievement of a balanced program in which each war plant is operating on a definite schedule has been the goal since the outset, but the job was so big and complicated that it was impossible to plan production effectively from the beginning.

When the WPB came into existence in the latter part of last year, the first big job undertaken was the slowing, and in many cases even

stopping, production of less essentials and the converting of industry to the production of war-time needs. Contracts were let by the various Government procurement agencies, including the Army, Navy, and the Maritime Commission, with a view toward beginning production as rapidly as possible and in tremendous quantities.

The priorities system, under which preference ratings were issued for millions of products and parts, worked fairly well for a while. Preference ratings insured that first things came first, but as our fabricating plants tooled up and began producing, our war production machine went into high gear and requirements for materials in many significant cases exceeded ability to supply them. Further-

more, as the war program gained in momentum more preference ratings were issued than there were materials to fill them.

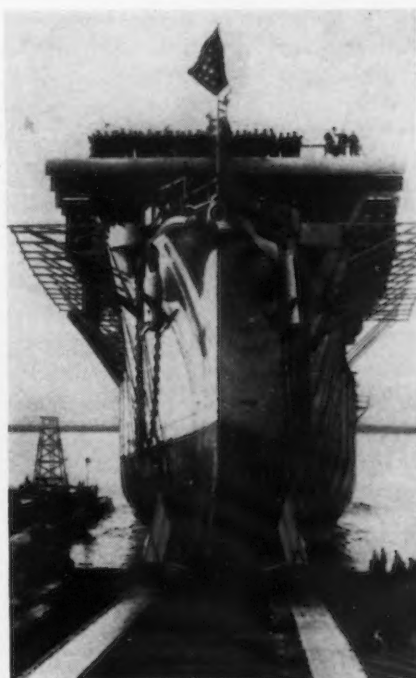
This situation developed into a contest between manufacturers to obtain increasingly large shares of the available supply of raw materials. This competition reached annoying proportions because some manufacturers, determined to keep their plants running on schedule, ordered more materials than needed and as a consequence, boasted that they were 60 per cent ahead of schedule on parts they were making for a particular military end product, while other plants, making parts for the same military end product might be running behind schedule for lack of steel. Probably sufficient steel would have been available for both groups had the available supply been distributed more effectively.

In an effort to improve the priorities system, the Production Requirements Plan was developed. Under PRP the WPB dealt with each manufacturer individually regardless of whether he was making a complete component, such as a tank or plane, or merely a part of a tank or plane. Thus, PRP in effect was an effort at obtaining horizontal allotment of materials. There are a number of reasons why PRP proved unsatisfactory for the total job. Orders continued to flow out for more products than there were materials to make them, and that led to production disturbances similar in character to those caused by the extensive use of both individual preference rating certificates and general preference orders.

In considering the Controlled Materials Plan it must be realized that we are living in an artificial economy of scarcity in respect to certain raw materials. That is why it is so necessary that the materials we have get to the right places at the right time to make the right things. To do this it is necessary to have an accurate knowledge of the materials and facilities available and an overall production program for all manufactured products balanced

THIRD IN 15 WEEKS: Just a day before Pearl Harbor Day this new aircraft carrier, the U.S.S. Belleau Wood slid down the ways at the New York Shipbuilding Corp. in New Jersey. This is the third carrier to be launched from this yard alone in the past 15 weeks.

Press Assoc. Inc. Photo



within the available supply of materials. CMP is intended to accomplish this purpose through the following organization plan and procedures.

Organization and Procedures

Following is an outline of the organization plan and procedures under the CMP. It is not intended to cover all details. The Controlled

cation form for allotment number to purchase controlled materials.

7. ALLOTMENT FORM. A form shown for the assignment of allotment number and authorization to purchase controlled materials.

8. PURCHASE AUTHORITY FORMS. A form certifying receipt of an allotment. This form must accompany purchase orders to suppliers of controlled materials.

9. CLASS A PRODUCTS. Any

The accomplishment of these objectives will require coordination and integration of activities performed in organization units as follows:

1. The claimant agencies, which are as follows:

War Department
Navy Department
Maritime Commission
Aircraft Scheduling Unit
Army Air Corps
Navy Bureau of Aeronautics

Office of Lend-Lease Administration
Bureau of Economic Warfare
Office of Civilian Supply

The primary responsibilities of the claimant agencies are to determine estimates of requirements for controlled materials for each of their major programs, all of which must be submitted to consideration to the Requirements Committee, and to supervise the allocation of allotments given them by the Requirements Committee so that the most economic use and balanced distribution of controlled materials are effected.

2. The Requirements Committee of WPB, which is composed of representatives of the State Department, War Production Board, and each of the above claimant agencies.

The primary responsibility of the Requirements Committee is to divide the available supply of each controlled material, by making an allotment for each month of the quarter to each claimant agency. It is the intention of the Requirements Committee to limit the aggregate allotments of any controlled materials to an amount which will not exceed the supply of such material, the availability of which is estimated by the Controlled Materials Division.

3. The Controlled Materials Divisions, which are:

Steel Division
Copper Division
Aluminum-Magnesium Division

The primary responsibilities of the Controlled Materials Divisions are to determine the total anticipated supply of each controlled material and to recommend for consideration by the Requirements Committee an appropriate reconciliation between aggregate requirements as stated by the claimant agencies and the anticipated supply of each Controlled Materials Division.

4. The War Production Board In-



Press Assoc. Inc. Photo

FLYING SUB: Doing practically the same job as a submarine this Navy TBF-1 plane is seen just a second after releasing its torpedo. The torpedo, whizzing through the air at high speed leaves a slight trail of vapor. Its propelling mechanism is ready to send it into its objective.

Materials Plan booklet issued by WPB and supplementary regulations not yet issued will, of course, be the final authority. The CMP is no cinch to master and it will require a good deal of clear thinking during the conversion period to make it work smoothly, but with proper administration it should yield immensely beneficial results.

Terminology of CMP

1. CMP. This means Controlled Materials Plan.

2. AGENCY. This means Claimant Agency.

3. BILL OF MATERIALS. This means a statement of the amount of production materials required for a given product.

4. OPERATING SUPPLIES. This covers maintenance, repair and operating supplies.

5. CONSTRUCTION AND FACILITIES. All elements of any construction or capital addition including all facilities, machinery and equipment entering into the same.

6. APPLICATION FORM. Appli-

product containing a controlled material except a Class B product. Class A products are essentially end products for definite military use.

10. CLASS B PRODUCTS. This means any product containing a controlled material listed on Class B list. Class B products are essentially normal civilian items which under present conditions may be used either as a component of an A product or in the civilian economy.

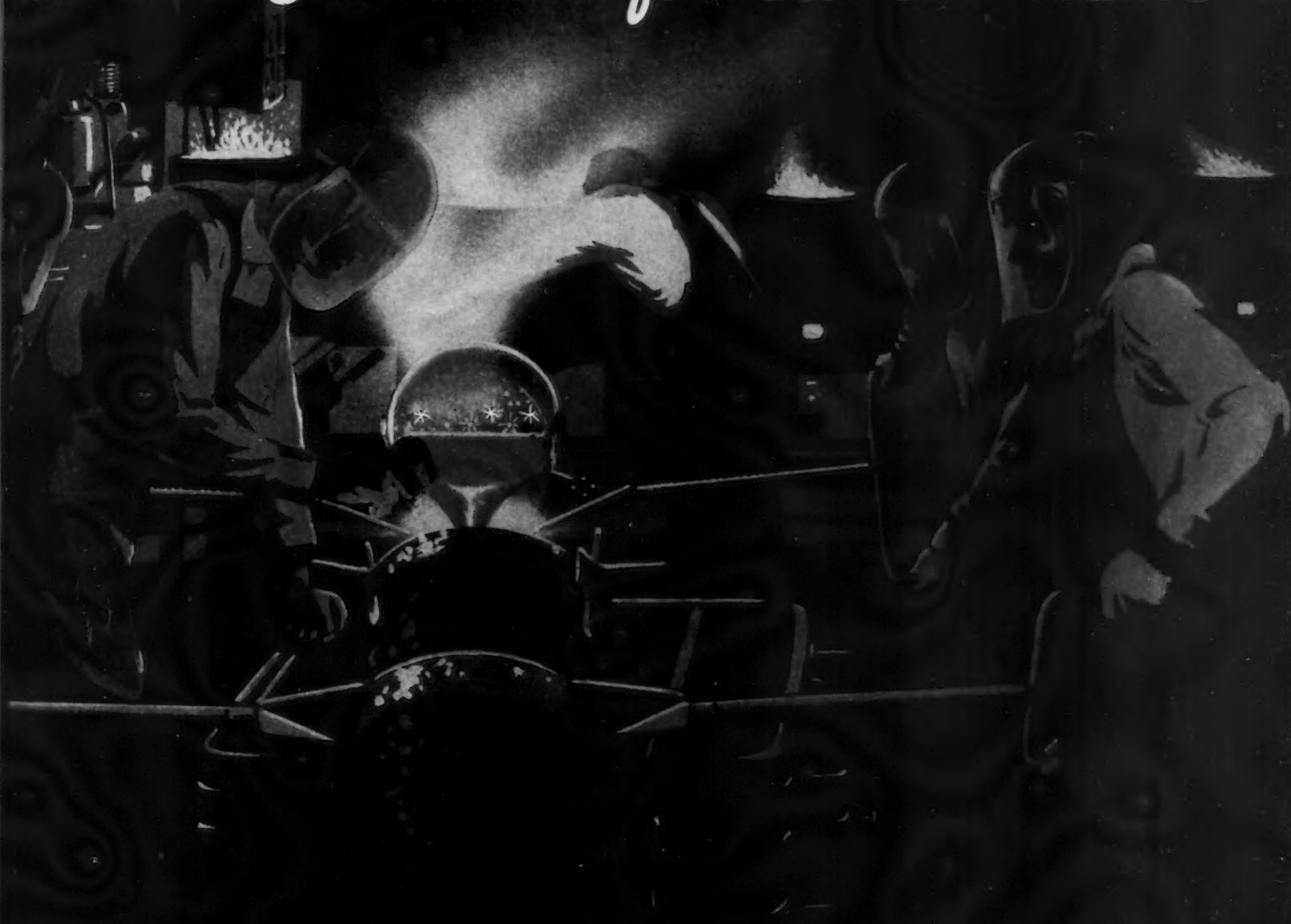
The purpose of CMP is to control the flow of critical materials in order to insure maximum production of war products and essential civilian products within the limits of available materials and facilities. These objectives require:

1. An accurate knowledge of the materials and facilities available.

2. An over-all production program for all manufactured products, balanced within the available supply of materials.

3. Production schedules timed to absorb all the materials as they become available.

New Significance for an Old Name



HOWARD has long been a dominant name in the nonferrous castings field. Howard castings have been widely used in many well known machines and equipments.

Today, the name Howard takes on a new significance. Three plants combined — an aluminum foundry, a bronze foundry and a magnesium foundry — provide the largest nonferrous jobbing facilities in the United States. Our new magnesium foundry has a capacity alone of over 500,000 pounds of castings per month.

Naturally, America's war industries have turned

to this dependable source of nonferrous castings; and all three plants are supplying the needs of makers of planes, guns, tanks, ships, military vehicles and essential machines.

Today, Howard castings are available only to those with adequate priority ratings, but war uses of nonferrous castings are pointing the way to new and important peace-time applications, especially in the field of magnesium. Accordingly, Howard will be in a position to render a broader service to industry after the war.

Howard Foundry Company
4900 Bloomingdale Road Chicago

HOWARD

ALUMINUM · BRASS · BRONZE · MAGNESIUM

CASTINGS

How You Can Simplify Your Scrap Disposal

The sale of iron and steel scrap should be—and can be—as satisfactory and pleasant as any business transaction in your plant.

Deal through a scrap broker in whom you have complete confidence.

In nearly half a century of scrap trading we have built on high standards of **SERVICE, TRUSTWORTHINESS and RESPONSIBILITY.**

We guarantee that **EXTRA SERVICE** which will give you the greatest possible monetary return and the least amount of trouble.

The
CHARLES DREIFUS
Company

(Scrap Brokers for Nearly Half a Century)

Philadelphia, Pa.
Widener Bldg.
Rittenhouse 7750

Pittsburgh, Pa.
Oliver Bldg.
Atlantic 1856

Worcester, Mass.
Park Bldg.
Worcester 6-2535

dustry Divisions, which include the following:

Aircraft Production
Automotive
Beverage and Tobacco
Building Materials
Chemicals
Communications Equipment
Construction Equipment
Consumer Durable Goods
Containers
Cork and Asbestos
Distributors
Farm Machinery and Equipment
Food
General Industrial Equipment
Government
Lumber and Lumber Products
Mining
Plumbing and Heating
Power
Printing and Publishing
Pulp and Paper
Radio and Radar
Rubber
Safety and Technical Equipment
Service Equipment
Shipbuilding
Textiles, Clothing and Leather
Tools
Transportation Equipment

and the following Materials Divisions which act as Industry Divisions for their respective industries:

Aluminum and Magnesium
Copper
Mica and Graphite

Miscellaneous Minerals
Steel
Tin and Lead
Zinc

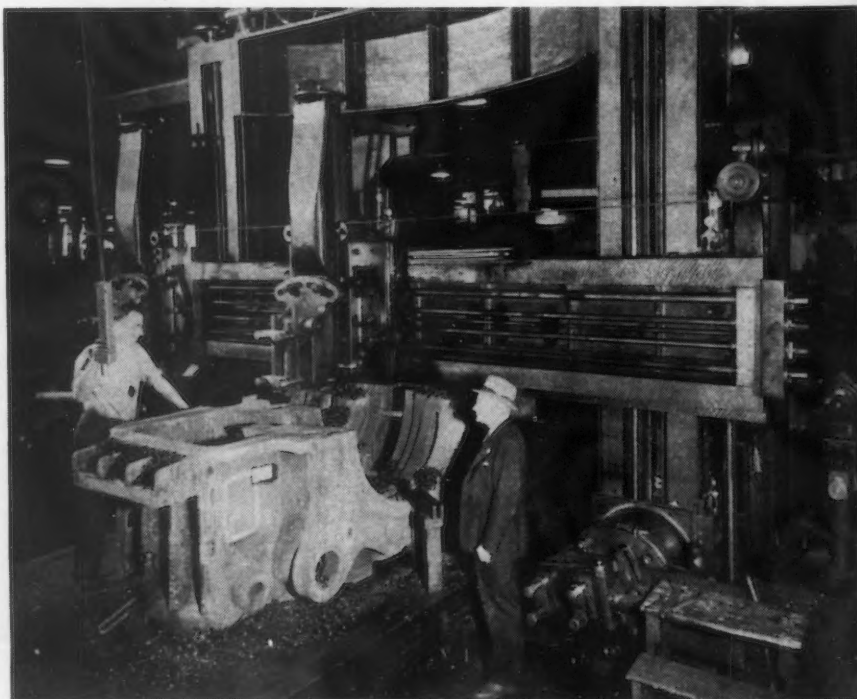
The primary responsibilities of the War Production Board Industry Divisions, acting in behalf of the Office of Civilian Supply, are to estimate the material needs both for indirect military requirements by collaboration with other claimant agencies and for the maintenance of civilian economy on a war time basis. Allotments made for these purposes will be distributed in behalf of the Office of Civilian Supply through procedures which will be administered by these industry divisions of WPB.

5. Prime consumers who are defined as manufacturers or others who receive allotments of controlled materials directly from claimant agencies.

6. Secondary consumers who are defined as manufacturers who receive allotments of controlled materials from prime consumers or other secondary consumers.

7. Controlled materials suppliers who are the producers of controlled materials established as such under CMP. For purposes of CMP, the producers of controlled materials are referred to as "suppliers," and warehousemen of these materials are

ANCIENT PLANER GOES TO WORK: This 12 ft. planer which was once the pride of the Columbian Exposition at Chicago in 1893 has been revitalized at one of General Electric's New England plants and is now helping to turn out propulsion equipment for combat and cargo ships.



SCRAP

that smile



The scrap situation is serious and calls for drastic and determined collections to wipe the smiles from the faces of our enemies. Look first for the obsolete and obvious junk. Then look with a more searching and merciless eye for those vast quantities of border-line material — old materials and old

equipment that are being kept for the remote possibility of future re-use. Consider carefully whether the possible re-use value outweighs the country's urgent need for scrap now. Don't stop with a short time "Drive" — scrap must keep moving to the steel mills in a continuous and ever increasing stream.

Reprints of this advertisement
available free on request

COPPERWELD STEEL COMPANY  WARREN, OHIO

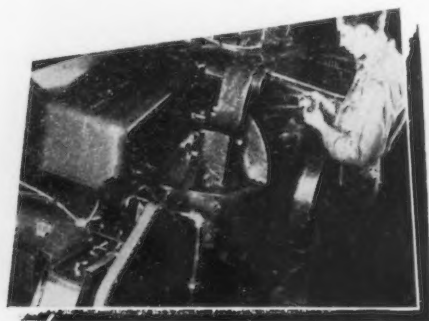
THE IRON AGE, December 17, 1942—95



YOU MAY BE WASTING HIGH PRIORITY STEEL !

NATURALLY you want to make most effective use of every pound of steel you can get. When your orders for bolts and rivets specify Oliver, you are conserving vital steel, because Oliver forges these fasteners by the upsetting, rather than the cutting method. This reduces scrap to an absolute minimum, and speeds production.

You can be supplied with the types and sizes of bolts, nuts, rivets, or other steel fasteners you need by Oliver—and be assured of using effectively every pound of steel your order requires. This is an efficient, patriotic way of best observing the restrictions on vital steel.



OLIVER
IRON AND STEEL
Corporation
PITTSBURGH, PENNSYLVANIA
BOLTS . . . NUTS . . . RIVETS
STEEL FASTENERS

also considered as suppliers under the plan.

Control Procedures

The Control Procedures that will be used under CMP can be discussed conveniently under four headings:

1. Accumulating bills of materials and applications for A and B products, construction and facilities, and operating supplies.
2. Allotting controlled materials and authorizing procurement of all other materials.
3. Ordering and delivering controlled materials and authorizing procurement of all other materials.
4. Changing from PRP to CMP under prescribed transition procedure.

Bills of Materials - - - Applications

Bills of Materials and Applications are necessary for two purposes:

1. To provide information to the Agencies from which estimated tonnage requirements can be prepared for presentation to the controlled materials divisions.
2. For information from which allotments can be made to consumers by the agencies and industry divisions.

In connection with the information to be obtained from bills of materials and applications, two dates are of great importance:

1. Jan. 1 is the date on which the claimant agencies must present their estimated requirements to the controlled materials divisions.
2. Feb. 1 is the date on which the requirements committee will make allotments to the claimant agencies.

Claimant agencies and industry divisions will issue requests for bills of materials to prime consumers asking that the completed bills of materials be returned by prime consumers before an established deadline.

Bills of Materials will be requested for all class A products and for all class B products for which it is practical to require bills of materials at this time.

It will probably take prime consumers at least one month to obtain bills of materials and/or applications from secondary consumers and compile them into summarized form. In consideration of that fact, claimant agencies will issue their requests at least one month in advance of the date when consumers must submit completed bills of materials or applications.

Each prime consumer will make his application for class A products to his agency. Each secondary consumer, producing class A products, will make his application to his prime consumer or to another secondary consumer. A producer of a class A product whose product is a part or sub-assembly of a class B product, will make his application to the class B product producer. Each class B producer will make his application for controlled materials to the appropriate industry division of WPB.

Applications for and allotments of materials for different uses are made as follows:

1. The agency will supply enough

ROLLING STONE SAVES: One time rolling stones came to a good end when general office employees of the General Electric Co. substituted them for the metal paperweights they had donated to the scrap drive.



FOR *HOT* METAL APPLICATIONS EC&M CONTROL



● 175-Ton Hot Metal Holding Ladle built by Treadwell Construction Co., Midland, Pa.

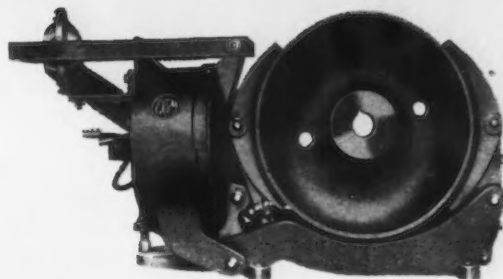
offers
**MANY
ADVANTAGES**



★ Wherever hot metal is stored, handled or processed, many firms, acquainted with EC&M value, select this quality apparatus because of their confidence in it—in the engineering and experience which it represents.

Typical hot metal applications include: (1) Ladle Cranes, (2) Hot Metal Cranes, (3) Hot Metal Mixers, (4) Bessemer Converters, (5) Storage Vessels, (6) Blast Furnace Guns—where only tried and true equipment which represents the utmost in safety and dependability is acceptable.

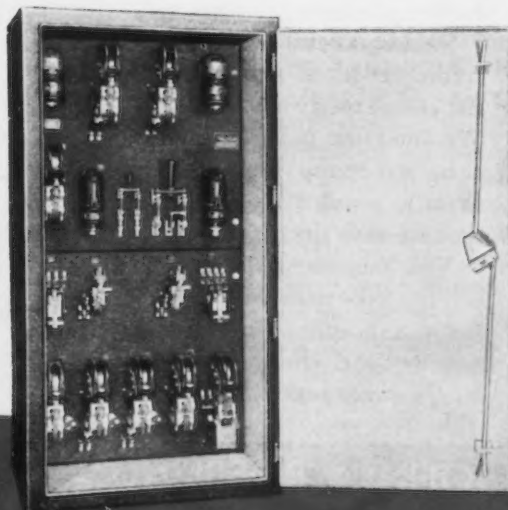
Listed at the left are a few of the EC&M products especially designed for the requirements of hot metal service. They have proved themselves highly successful in many applications throughout the years. Specify EC&M Control for hot metal applications.



● EC&M Air and Magnetically-operated Type WB Brake—normally operated by motor current with air-release for emergency operation.

EC&M EQUIPMENT Especially Designed for Hot Metal Service

- 1 EC&M Converter Control System (Patent No. 1,899,586)
- 2 Dead-Man's Master Switch
- 3 Air and Magnetically-released Brakes
- 4 Positive-type Limit Stops for Slowdown and Final Stopping
- 5 LINE-ARC Magnetic Contactor Controllers.

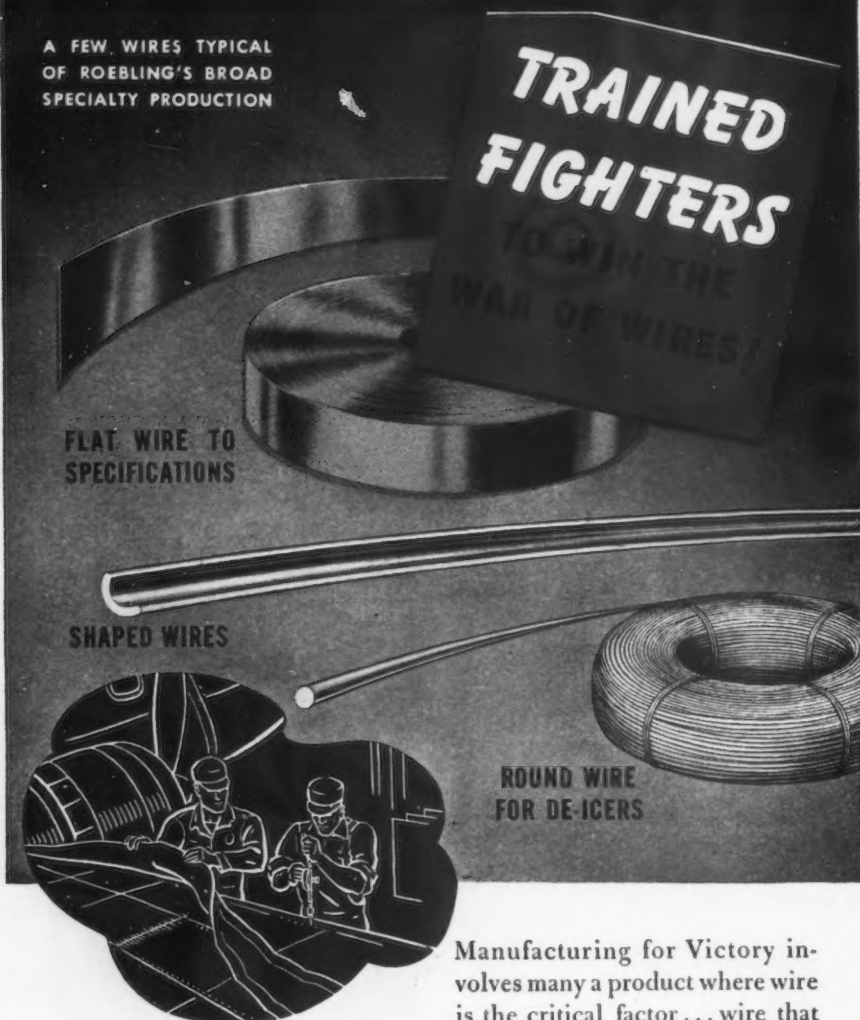


THE ELECTRIC CONTROLLER & MFG. CO.
2700 E. 79th ST. CLEVELAND, OHIO

ROEBLING Wires

ROUND... FLAT... SHAPED

A FEW WIRES TYPICAL
OF ROEBLING'S BROAD
SPECIALTY PRODUCTION



Manufacturing for Victory involves many a product where wire is the critical factor... wire that must be made to new standards

of toughness, accuracy and finish. Gain time and get more out of your equipment by letting Roebling solve these problems for you... delivering wire that is ready and willing to go to work without further processing.

Steel backbone for the pulsating rubber strip that cracks ice off leading edges of airplane wings is typical of many special round, flat and shaped wires that are rolling from the Roebling mills today. We know the importance of steel analysis and grain structure in these war-bound wires... of rolling and toughening and finishing them to avoid delays on both the production and fighting fronts. And we have the experience and facilities to deliver... on schedule.

You, too, can get one jump ahead on production quotas when you start with Roebling wire... made to specifications demanding closest adherence to physical and chemical requirements. Prompt action on war orders.



JOHN A. ROEBLING'S SONS COMPANY

TRENTON, NEW JERSEY

Branches and Warehouses in Principal Cities

application forms to the prime consumer for distribution to secondary consumers who will eventually receive their allotments from the prime consumer's initial allotment which will be issued on a special form.

2. Secondary consumers who are manufacturers of class A products will list their controlled material requirements on the application forms and forward them to the consumer from whom they will receive allotments.

3. These accumulated applications will be summarized by the prime consumer and a total tonnage application will be made by him to the agency (except in the following case).

4. If the prime consumer is a manufacturer of class B products, the summarized application will be made to the appropriate industry division of WPB.

5. Applications for controlled materials for class B products, construction and facilities, and operating supplies, will be made on an application form to the appropriate agency or industry division. In the case of construction and facilities, these applications will be made to the agency if the project

BRITISH "FORTRESS": Clyde Pangborn sits at the gunner's controls that operate the top gun turret on an Avro-Lancaster, the British equivalent of our Flying Fortress. The British ship, however, weighs 10 tons more. It mounts ten .303 machine guns and is powered by 4 liquid cooled Rolls Royce Merlin engines.

International News Photo



is for the agency's sole benefit, otherwise to the appropriate industry division. In the case of operating supplies, applications are made to industry divisions.

6. Applications for other than controlled materials for class B products, in those cases where the class B product has not been assigned an end product schedule or given a specific production program, will be made on a form similar to PD-25A.

The prime consumer is responsible for the accuracy of the summarized bills of materials and applications which he must submit to the agency or industry division, including those submitted to him by secondary consumers.

The secondary consumer is responsible for the accuracy of the bills of materials and applications he must submit to the prime consumer, including those submitted to him by his secondary consumers.

Allotting and Authorizing

Between Dec. 15 and Jan. 1, the claimant agencies including the

Office of Civilian Supply (and the industry divisions) will prepare estimated tonnage requirements for all products and programs.

On Jan. 1 the claimant agencies will submit to the controlled materials divisions of WPB (with a copy to the requirements committee) estimated tonnage requirements for all products and programs.

These tonnage requirements must be broken down to show material requirements separately for:

1. Production (class A and class B products).
2. Construction and facilities.
3. Maintenance, repair and operating supplies.

By Jan. 1 and 15 the controlled materials division and the office of the program vice-chairman will analyze and make preliminary adjustment between the requirements submitted by the claimant agencies and the available materials.

On Jan. 15 the controlled materials divisions will submit to the requirements committee complete

information as to the requirements of each claimant agency, the materials available and recommendations to balance supply and demand.

Between Jan. 15 and Feb. 1, the requirements committee will compile final adjusted allotments of controlled materials for all agencies.

On Feb. 1 the requirements committee will allot to each claimant agency, tonnages of controlled materials which will be available for the programs for the second quarter of 1943 by months.

During February the claimant agencies will distribute allotments of controlled materials to consumers on the allotment form to prime consumers for class A and class B products, and to prime consumers for construction and facilities, and for operating supplies.

Allotments for non-controlled materials will be made to consumers on a form similar to PD-25A to class B product consumers with no end product schedule, and to all consumers for operating supplies.

Any prime consumer using controlled materials in the production of class A end products will obtain allotments of controlled materials for such products from his claimant agency.

Any consumer using controlled materials in the production of class A products supplied as component parts or sub-assemblies to any other consumer making class A or class B products will obtain his allotments from such other consumer.

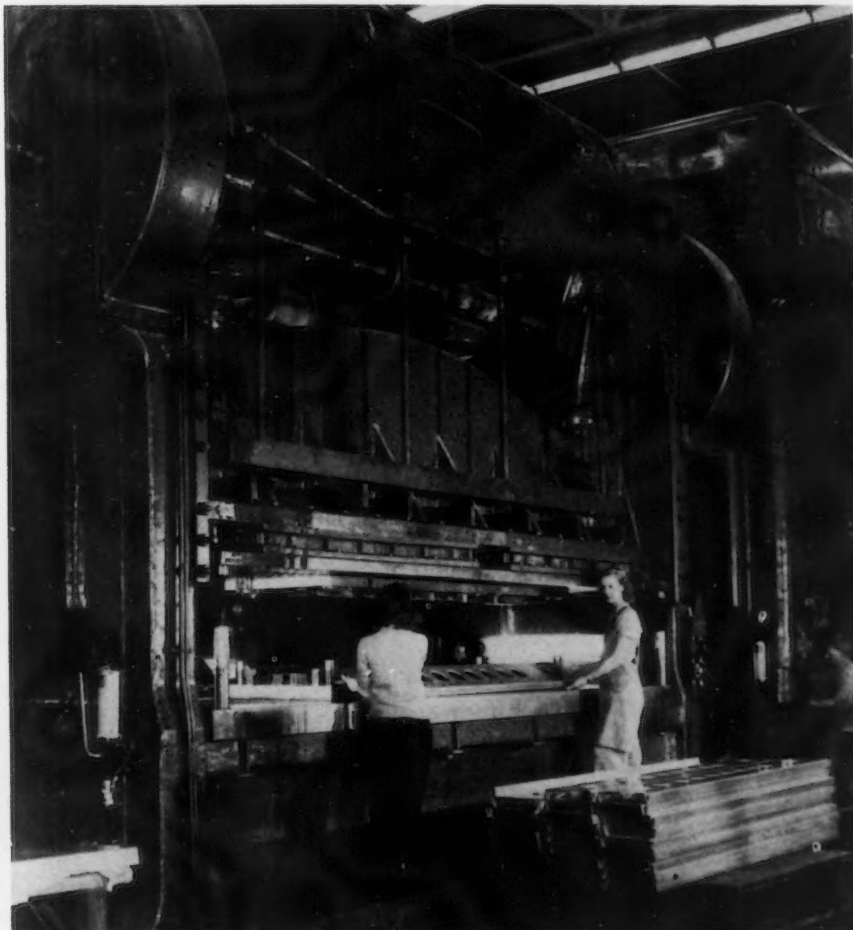
The prime consumers immediately upon receipt of "allotment" will divide allotments among their secondary consumers and issue allotment extensions (and so on, to all secondaries).

This issuance of allotments and allotment extensions will take place during February and March. No allotments will be issued to class B product consumers by other consumers at any level.

Each allotment of controlled materials will be assigned an allotment number. For example: W-1234-567-16. The first letter represents the claimant agency; the next four digits, the program number; next three digits, the authorized schedule; next two digits, the month (January, 1942, is 1) (April, 1943, is 16). The allotment number must be noted on all authorized purchase orders or releases against purchase orders placed.

A preference rating will be assigned with each allotment number.

THE BIG AND THE SMALL: Dwarfed by the size of this huge press, these women employed in Ford's Willow Run bomber plant are regular operators. The press, under their capable management, stamps out aluminum sections for B-24 bombers.



Steel Must Go Where Most Needed, Fairless Says at Pittsburgh

Pittsburgh

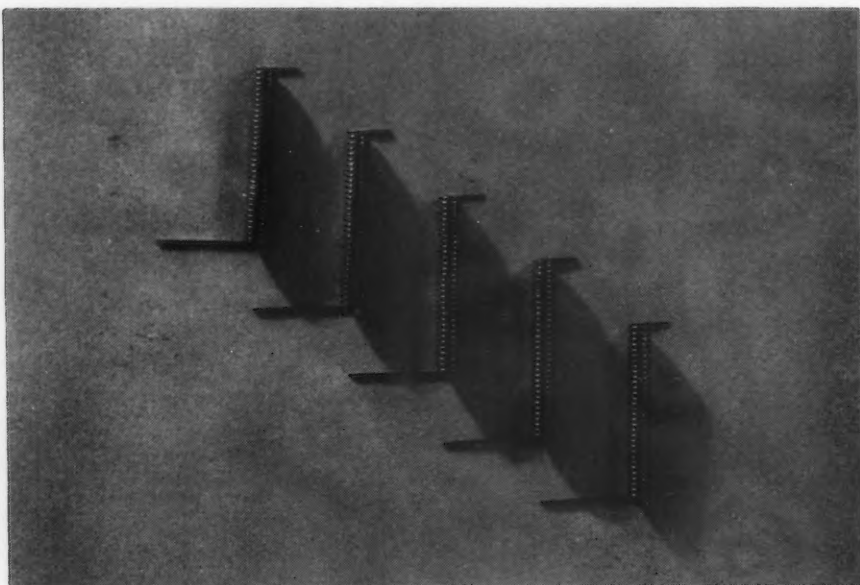
••• If steel is the essential item which will win the war, the steel industry can make enough steel, but it is up to those with the proper responsibility in government to see that steel goes where most needed, Benjamin F. Fairless, president,

U. S. Steel Corp. of Delaware, told newspaper men here last week at the first U. S. Steel Corp. of New Jersey board meeting to be held at Pittsburgh.

Board Chairman Irving S. Olds said that the entire Pittsburgh program for war expansion involving the U. S. Steel Corp. amounts to \$289,000,000, 66 per cent of which is for the account of the U. S. government. "It is expected that all of these Pittsburgh projects will

go into operation during the first half of 1943," Mr. Olds said.

Answering a wide variety of questions at a press conference, Mr. Fairless expressed no concern as to the danger of Lake Superior iron ore supplies becoming critical. In explaining his attitude he said that probably during the lifetime of every newspaper man present the supplies of iron ore from the Mesabe Range would not reach what could be termed a critical stage. "In the 27 years I've been in the steel industry, I have heard reports every year to the effect that we faced a critical situation with respect to iron ore from the Lake Superior regions. The U. S. Steel Corp. has programs under way and is ready at any time necessary to embark on an expanded program of utilizing lean ores and sintering them," Mr. Fairless said. The question of iron ore came up when a newspaper man remarked that he had seen several statements that



No Whipping!

High speed, accurate production of extra long torsion springs is now possible by applying a newly patented device to a Torsion attachment on any Torrington Spring Coiler.

The device supports the spring beyond the critical length where "whipping" starts, making it possible to produce extra long torsion springs which heretofore could not be made on any Torsion Spring Coiling Machine. And springs hitherto produced with the Standard Torrington Torsion Attachment can now be made at higher speeds without distortion.

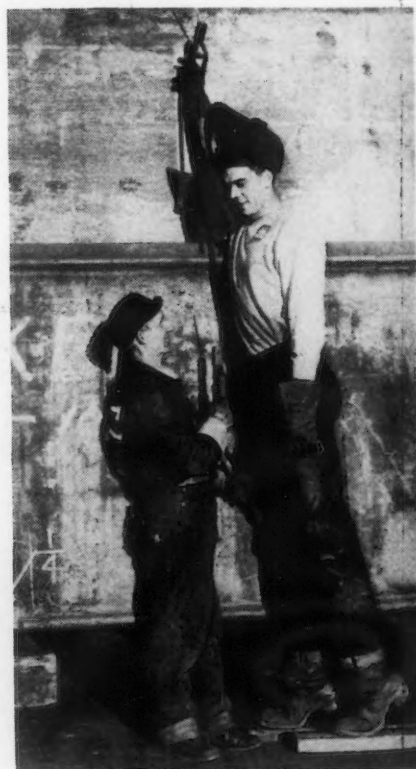
This inexpensive device, which was developed to solve a customer's problem, typifies the engineering assistance which we offer to all professional spring makers.



THE **TORRINGTON**
MANUFACTURING COMPANY
TORRINGTON, CONNECTICUT

A MAN FOR EVERY JOB: No matter what size welding job you have this Los Angeles shipyard has the man for it. Typical of its facilities to handle any situation, is this welding team made up of R. L. Shaw, 6 ft. 11 in. and 220 lb. working with F. B. Garner who is 2 ft. shorter and 100 lb. lighter.

International News Photo



SPIRAL WOUND BRUSHES

TALK with our engineering representative about your finishing problems. He will gladly work with you in developing Spiral Wound Brushes—of wire, horsehair or tampico—to meet your particular production requirements.

Pittsburgh Plate Glass Company's Spiral Wound Brushes pay for themselves—many times over!—in the time and money they save.

Write for further information and for latest catalog of maintenance brushes.

Built to Your Order



Brush Division

PITTSBURGH
PLATE GLASS COMPANY

Baltimore, Md.

BRUSHES FOR EVERY INDUSTRIAL REQUIREMENT

**"FAST AS GREASED LIGHTNING
... ASSEMBLING JOBS
WITH PHILLIPS SCREWS"**



AND DON'T FORGET!

PHILLIPS SCREWS COST LESS TO USE"

Use of Power Tools • Speedier Driving • No Slipping = 50% Less Assembly Time with Phillips Screws

Here's a way you can prove to yourself that Phillips Recessed Head Screws are "fast as greased lightning."

Check up on how many assemblies your crew handles in a day, using slotted screws. Then—give them a day's supply of Phillips Screws. Even without a change in *driving* method, production will go up. And since Phillips Screws end driver slippage, they can use power tools—with the result (on the aver-

age) that they can *double* their output.

You will *eliminate wasted effort* because the Phillips Screw clings to the driver; *prevent lost-time accidents* because screwdriver injuries are no more; and *get stronger fastenings* because Phillips Screws seat tight without heads splitting. In addition you save an average of 50% in cost as well as time.

Any of the firms listed below can supply you.



PHILLIPS RECESSED HEAD SCREWS

GIVE YOU *2 for 1* (SPEED AT LOWER COST)

**WOOD SCREWS • MACHINE SCREWS • SHEET METAL SCREWS • STOVE BOLTS • SPECIAL THREAD-CUTTING SCREWS
• SCREWS WITH LOCK WASHERS**

American Screw Co., Providence, R. I.
The Bristol Co., Waterbury, Conn.
Central Screw Co., Chicago, Ill.
Chandler Products Corp., Cleveland, Ohio
Continental Screw Co., New Bedford, Mass.
The Corbin Screw Corp., New Britain, Conn.
International Screw Co., Detroit, Mich.
The Lamson & Sessions Co., Cleveland, Ohio
The National Screw & Mfg. Co., Cleveland, Ohio

New England Screw Co., Keene, N.H.
The Charles Parker Co., Meriden, Conn.
Parker-Kalon Corp., New York, N.Y.
Pawtucket Screw Co., Pawtucket, R.I.
Phocell Manufacturing Co., Chicago, Ill.
Russell, Burdick & Ward Bolt & Nut Co., Port Chester, N.Y.
Scovill Manufacturing Co., Waterbury, Conn.
Shakeproof Inc., Chicago, Ill.
The Southington Hardware Mfg. Co., Southington, Conn.
Whitney Screw Corp., Nashua, N.H.

NEWS OF INDUSTRY

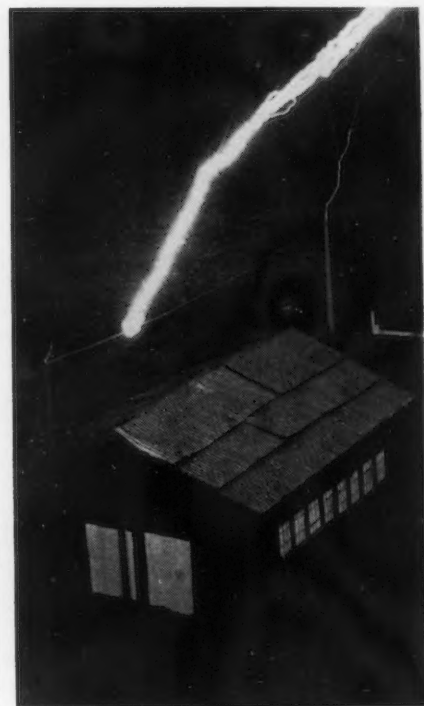
high grade Lake Superior ores would be dangerously diminished within the next 7 or 8 years.

Both Mr. Olds and Mr. Fairless stated that little or none of the cancellations in certain war contracts had affected U. S. Steel-government projects as far as actual iron and steel making was concerned. "Certain finishing operations for armor plate at one of our Chicago district plants and at our Farrell plant involving armor plate expansion have, however, been affected to some extent," Mr. Fairless said.

After present expansions are completed, neither Olds or Fairless expect the position of the Pittsburgh steel district to be changed materially from what it now is, the leader, as far as steel ignot capacity is concerned.

When asked whether old equipment would be retired after the war and replaced by the new government-owned steel plants if the com-

LIGHTNING ARRESTER: This man-made bolt of lightning streaking toward a laboratory model of a high explosive plant reveals the new lightning arrester designed by Dr. Gilbert D. McCann of Westinghouse Electric & Mfg. Co. All that is required is a length of steel wire stretched between wooden poles above the building to be protected. The ends of the wire are attached to steel poles driven into the ground which carry the lightning harmlessly to earth.



We trimmed its waist-line
and made a better, simpler stud setter



HERE'S a brand new setter, slick as a whistle, trim as a pencil. It'll get into tight spots with ease and accuracy . . . save vital production minutes in many ways. Its small O.D. and remarkable ruggedness make it a desirable tool for either hand or power operation. Can be adjusted to any desired length of thread on stud in a few seconds.

Four sizes cover a range of studs up to $1\frac{1}{4}$ ". You can have Morse taper shanks, hexagon, T handle, square female or T handle combination with a square female drive for use with a torque wrench. Types to fit any make of power tool. Made to customer specifications when requested.

Write for Bulletin No. 101.

APEX

THE APEX MACHINE & TOOL CO., DAYTON, OHIO

Manufacturers of friction tapping chucks, quick change and positive drive drill chucks, vertical float tapping chucks, parallel floating tool holders, power bits for Phillips, slotted head and Clutch Head screws, hand tools for Phillips and Clutch Head screws, aircraft universal joints, plain and universal joint socket wrenches.

pany should take up certain options contained in government contracts, Mr. Fairless said, "This will depend upon the total demand for steel at that time. We will operate from an economical standpoint and if demand is great enough to take care of all the plants which are working at the present time, that will be done. However, if demand for steel declines from high war peak levels, we will retire those uneconomical units in favor of the more recent improvements. During war times many plants must be op-

erated which would not be the case during peace times since the paramount question is production of steel."

Referring to steel backlogs which in some quarters have been reported as declining substantially, Mr. Fairless said that unfilled steel business in U. S. Steel Corp. subsidiaries has shown little change in volume in recent months and that the backlog had remained at a more or less stabilized level. Incoming orders, he indicated, were about equal to or in excess of shipments.

Answering a question as to whether the corporation would go on a 6-day week or 48 hours a week, Mr. Fairless said this has been the case for some time. "Averages are misleading. While the average number of hours worked per week might be 42 or 43, we have many many workmen who are putting in 48 hours a week or more. We have some working 6 and 7 days a week. On the other hand, some workmen at plants making restricted products such as tin plate, are not getting more than 3 days a week, which cuts down general average," Mr. Fairless said.

The U. S. Steel Corp. has approximately 46,000 employees in the armed services, according to Mr. Olds, and while both he and Fairless indicated "at the present the manpower situation has not affected steel production, we do have some serious problems ahead." The experiment of the corporation at Chicago where a test training period, involving women for crane operators was conducted, has proven successful, according to Mr. Fairless. It was pointed out, however, that the specifications for such an employee are not simple. Girls are now working as operators on lighter cranes in Chicago.

On the question of scrap supplies which have come in for a lot of national statements lately, Mr. Fairless said, "there is an abundance of scrap for the steel industry at the present time but scrap is something we must keep fighting for all the time and we must have no letup in drives, especially in view of the effect cold weather has on the scrap supply situation." Mr. Fairless indicated that in its relation to the steel industry as a whole, the U. S. Steel Corp. purchases less scrap in the open market than is generally supposed and on a relative basis probably buys less market scrap than most any other steel company. U. S. Steel uses a considerable amount of scrap but on the other hand produces a substantial tonnage of home scrap, synthetic scrap, and bessemer hot metal.

Sponge iron also came in for questioning with both Olds and Fairless inferring that sponge iron can be made and "we can make it, but our raw material plans do not call for sponge iron since it would be uneconomical for us to substitute this direct reduction for our present blast furnace practice."

Ask

MEAKER!

Equipment for

GALVANIZING

(Electro Process)

PICKLING

CLEANING

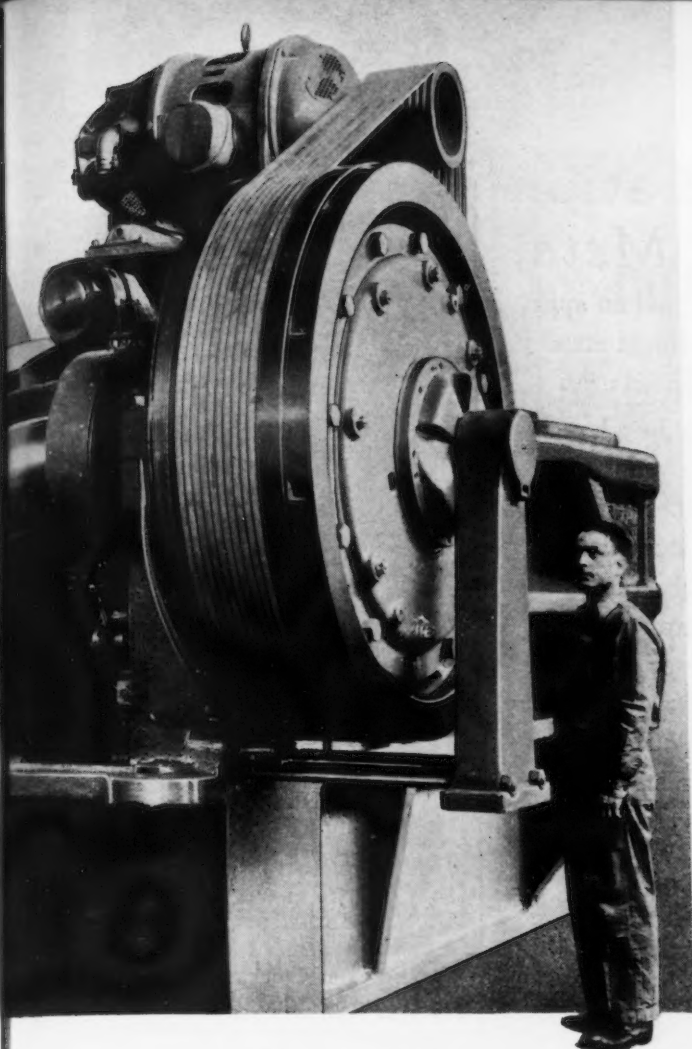
PLATING

At your Service . . . the country's
leading practical plating engineers.

ADDRESS:

The MEAKER Co.

1635 So. 55th Ave., Chicago



Ajax

DIRECT-ACTING AIR CLUTCH

reduces

FATIGUE

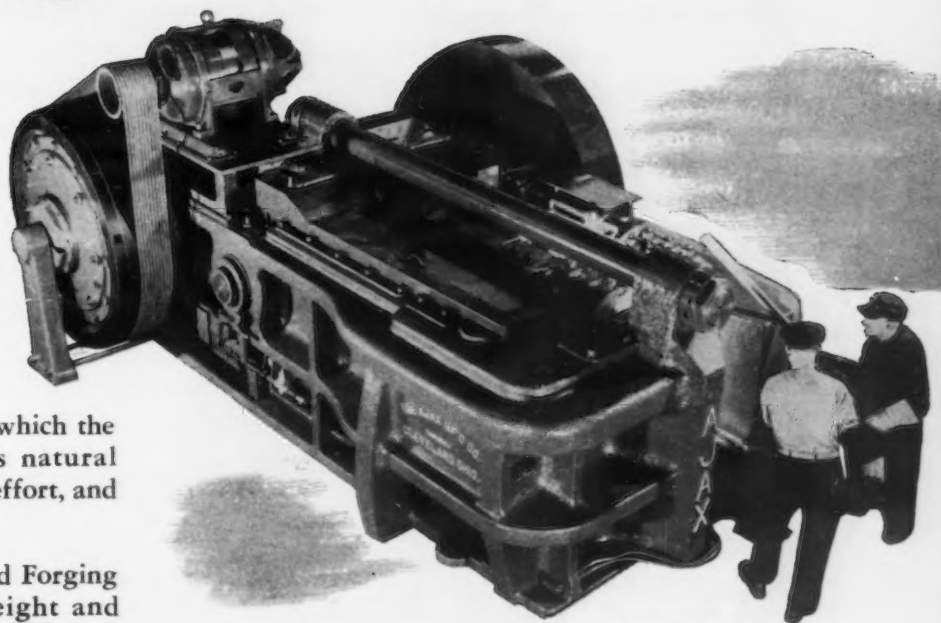
conserves

**SKILLED MAN POWER IN
PRODUCING UPSET FORGINGS**

THE AJAX Direct-Acting Air Clutch, originated by Ajax Engineers over ten years ago, is an important factor in enabling the skilled forge man to maintain higher outputs over longer shifts with less fatigue. Its instantaneous response reduces the time he must support the forging stock between passes as there is no delay waiting for the machine to respond to the treadle. This permits the forge man to adjust the operating frequency of the machine to his own natural working rhythm, while the ease with which the machine is treadled in no way disturbs his natural balance. The result is more forgings with less effort, and maintained production with less fatigue.

These features of the Ajax Air Clutch-operated Forging Machine, together with proper operating height and convenient throat design, which permit the operator to handle work into the dies with less exertion and conserve his energy, are basic for maintaining higher hourly outputs over longer shifts. They are further evidence that during either war or normal times, mechanical soundness is the logical basis on which to select forging equipment.

Write for Bulletin No. 65B.



★ ★ ★ ★ ★
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**BUY FORGING
EQUIPMENT ON THE BASIS OF
MECHANICAL SOUNDNESS**

THE **AJAX**

MANUFACTURING COMPANY

EUCLID BRANCH P. O. CLEVELAND, OHIO
621 MARQUETTE BUILDING • CHICAGO, ILLINOIS

Insure Continuous Operation While Saving Critical Metal

This story suggests a way to aid both. In a cane sugar refinery, Amsco 13% manganese steel trolley wheels have been used for 27 years on the overhead trolley system which facilitates the rapid, orderly and economical movement of materials into and through the plant. In a busy sugar refinery these wheels have to stand a lot of abrasion and stress, and in time even manganese steel requires replacement.

When the metal situation became acute, conservation methods became in order when such replacements were needed. Besides complete new wheels, as shown in C-350, our customer has been ordering new tires, as shown in R-702. These manganese steel tires are mounted on the old hubs, giving new wheel service at only part of new wheel cost. Sugar pro-

duction carries on, and an appreciable amount of critical metal is saved for other essential uses.

This procedure may be adaptable to light duty car and trolley wheels used in other industries where manganese steel tires can be mounted on hubs of manganese steel or other iron or steel by hydraulic pressure or shrinking; and the possibilities do not stop with wheels. Where other wearing parts of manganese steel have to be replaced, it may at times be possible to redesign them so as to replace only the portion which must stand the wear. This in turn may save you money and will undoubtedly save critical metal.

Consider the possibilities in your own plant, and if you see a good "bet," our engineers will be glad to analyze your idea and report to you.



It requires an unending stream of scrap to keep the steel mills going—dig it up and get it in!

A new bulletin, 842-WS, pictures and describes Amsco manganese steel wheels and rollers for many industries.

Amsco
AMERICAN MANGANESE STEEL DIVISION
OF THE AMERICAN BRAKE SHOE & FOUNDRY CO.
Chicago Heights, Illinois
FOUNDRIES AT CHICAGO HEIGHTS, ILL.; NEW CASTLE, DEL.; DENVER, COLO.; OAKLAND, CALIF.; LOS ANGELES, CALIF.; ST. LOUIS, MO.
OFFICES IN PRINCIPAL CITIES

Genuine Manganese Steel, "The Toughest Steel Known"
Chromium-Nickel Alloy Castings for heat and corrosion
Power Shovel Dippers. Dredge and Industrial Pumps
Welding Materials for reclamation and hard-surfacing

NEWS OF INDUSTRY

New Government Manual Is Ready Reference Handbook

• • • The U. S. Government Manual—prepared and issued by the Public Inquiries Division of the Office of War Information—is an up-to-the-minute, ready reference handbook on the federal government. Its 700 pages detail the legislative powers, functions, location, and names and titles of chief officials of all of the government departments and agencies. It also contains organization charts, a list of current federal publications, and an invaluable section on "abolished and transferred agencies and functions." It is fully indexed both by subject and personnel. As a reference book the manual is as important to citizens dealing with their government as a dictionary is to a secretary.

The fall-winter 1942 edition of the manual is available from the U. S. Information Center or the Superintendent of Documents, Washington, D. C., for \$1, either in money order or check.

NEWEST AND BIGGEST: Launched on the anniversary of Pearl Harbor this newest and mightiest of the U. S. battleships slid down the ways in Philadelphia. The ship is said unofficially to carry nine 16 in. rifles and hundreds of smaller guns and to have a speed in excess of 30 knots an hour.

Press Assoc. Inc. Photo





Harris and Ewing

SOMERVELL DENIES OVEREXPANDED CONSTRUCTION: Lieut. Gen. Brehon Somervell, chief of the Army Services of Supply, shown as he appeared before the Senate Small Business Committee. He denied charges that the Army had over-expanded its plant construction program and that as a result many new factories were now standing idle. He agreed that "because of a lack of materials a number of plants haven't been able to operate at full capacity at all times." But none of these plants, he asserted, are "useless" to the war program.

(CONTINUED FROM PAGE 99)

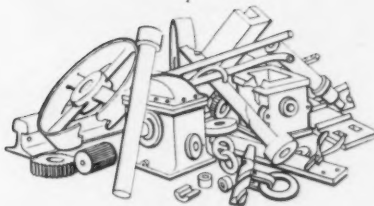
This preference rating will not affect deliveries of controlled materials or programmed products except in cases of manufacturing conflict between programs. Such conflict will be resolved by application to the proper agency or industry division if the preference rating will not solve it.

AAA preference ratings will take precedence over all allotment numbers and over all other preference ratings at all levels except allotment number orders with controlled materials suppliers.

Materials other than controlled materials will be authorized by preference ratings only. (Except that "M" orders will continue in force and operation for specific materials other than controlled materials until further notice.)

The authorized end product schedules will govern the quantity of "other" materials which may be

THERE MAY BE A BATTLESHIP IN YOUR PLANT



EQUALS



WE NEED YOUR SCRAP METAL

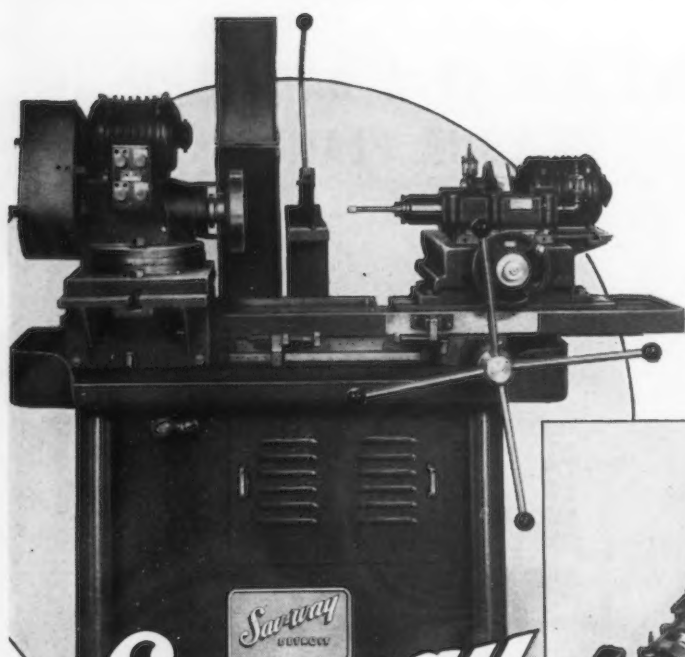
Believe it or not, there is a shortage of scrap metal in yards at the mills. The shortage is so serious that unless every pound of scrap is salvaged the steel mills may be forced to slow down.

Such a thing must not happen here.

The steel industry is faced with the necessity of digging up six million *extra* tons of scrap metal to complete the 1942 steel requirements of eighty-eight million tons. This extra scrap tonnage must come from plants, shops, garages, farms, and homes. It's up to every loyal American to cooperate.

Go over your plant carefully and dig up all the scrap metal you can find. Post notices on bulletin boards telling your employes about the scrap salvaging campaign. The mills need every pound of scrap they can get, and they need it **NOW!** — not next year. Don't overlook any possibility — every pound counts. The urgency cannot be overemphasized.





Sav-way

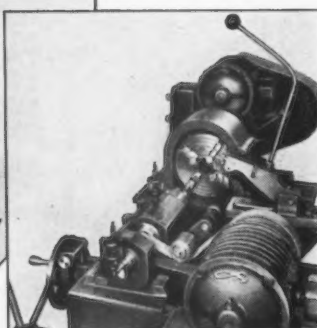
MULTI-PURPOSE

INTERNAL GRINDER

Grinds $\frac{1}{4}$ to 18" diameter holes, up to 9" deep, straight or tapered. Sav-way grinder offers greater flexibility and will handle a wider range of work than has heretofore been possible on any one machine. Sturdily constructed throughout and suitable for both tool room and production grinding. "Bulletin MI" giving complete specifications sent on request.

Representatives throughout the U. S. A.

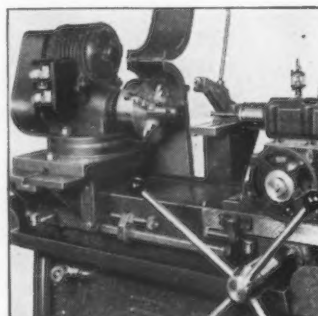
Sav-way INDUSTRIES
★ Machine Tool Division ★
 4867 EAST EIGHT MILE • DETROIT, MICHIGAN



Looking down, from grinder head end.



Looking from headstock end, guard removed; note step pulleys providing various work head speeds. Headstock may be slid crosswise any desired distance up to six inches.



Front, angle view, work in chuck. Headstock graduated thru 180 degree.

purchased and the rate at which they may be purchased (for products to which an end product schedule has been assigned).

The prime consumer may not procure "other" materials in greater quantities or at a more rapid rate than required by his end product schedule as authorized by an agency or industry division.

The secondary consumer may not procure "other" materials in greater quantities or at a more rapid rate than required by his schedule for parts or sub-assemblies as authorized by his prime consumer or another secondary consumer.

Ordering and Delivering

Upon receipt of allotment number and allotment, consumers may place orders for controlled materials with material suppliers. These controlled materials are to be delivered as authorized, using as authorization the "Controlled Material Purchase Authority."

No part of a purchase order shall be deemed an authorized order until the applicable allotment number for that part of the order has been released, specifying deliveries consistent with allotment schedule and covered by allotment number.

No authorized orders shall be placed (or release issued) to specify delivery for "other" materials at a more rapid rate than required by an authorized allotment schedule covered by an allotment number.

A consumer of controlled materials who receives numerous purchase orders bearing allotment numbers authorizing the purchase of small quantities of controlled materials may combine such small allotments into one purchase order to the materials supplier (subject to regulations detailed in CMP).

A controlled material supplier receiving an authorized order or release (bearing an allotment number) may ship such order any time from the 15th of the month preceding the month specified to the last day of the month succeeding the month specified, or during a 75-day period.

Changing from PRP to CMP

Some consumers of controlled materials may not be able to obtain allotments of controlled materials in time for second quarter operations. For these cases the PD-25A authorization for the first quarter of 1943 will be extended (for the same quantities of materials or adjusted

by PD-25F). These extensions will apply to the second quarter of 1943.

If a PRP unit receives allotments under CMP after having received authorization on PD-25A (for the second quarter), the authorization on PD-25A must be reduced by the amount of allotments made under CMP.

Orders bearing CMP allotment numbers for controlled materials or for products containing controlled materials, will be given preference over orders under the PRP. It will therefore be beneficial to all consumers to get into operation under the CMP as rapidly as possible.

Warehouses

Warehouses handling controlled materials are considered as suppliers of controlled materials under CMP. The controlled materials divisions will arrange to stock such warehouses. Warehouse stocks will be available to fill authorized orders

GERMAN GENERAL CHECKS HIS BOMBERS: Peering through a periscope device, Gen. Ritter von Creim of the German air force, observes a German dive-bomber attack on the central Russian front near Rzhev, according to the caption accompanying this picture, which arrived in the U. S. from neutral Portugal.



Standard . . . the **RIGHT NAME** in forgings



Good steel plus expert craftsmanship are responsible for Standard's 147 years of success in steel product manufacture. Today, as in the past, the proven quality of forgings by Standard is being maintained.

The dependability built into every product delivered to Standard's customers is safeguarded by rigid control of every phase of production from acid open hearth to finished forging. Expert chemists and metallurgists carefully analyze all mate-

rials . . . trained personnel takes pride in strict adherence to customer specifications . . . and Standard's modern plant offers the finest shop facilities for producing better steel products.

FORGINGS • CASTINGS • WELDLESS RINGS • STEEL WHEELS

STANDARD STEEL WORKS



DIVISION OF
THE BALDWIN LOCOMOTIVE WORKS
PHILADELPHIA

(with allotment numbers) up to quantities to be specified by the materials divisions or by a claimant agency. Warehouses also will carry earmarked stocks for claimant agencies to the amount agreed upon between the claimant agencies and controlled materials divisions, or as determined by the program vice-chairman. Warehouses also will fill small orders up to the amount to be specified by controlled materials divisions without allotment number for this type of order.

Inventory Control

Each prime or secondary consumer of controlled materials (with inventories in excess of amounts to be specified) shall submit an inventory report on Jan. 15, 1943, for inventory as of Jan. 1. The inventory will be for all CMP materials.

Inventories will be submitted to the materials redistribution division of the WPB. These data will be used to regulate the amount of inventory a fabricator of class A or

The SPRING that WINDS ITS TAIL on ITS BODY

AT TIMES only a torsion spring will do. And only a unique torsion spring at that... such as one of the "double-coil" torsion springs below. You see, to achieve proper spring length where the retaining pin or shaft is short, these double springs are coiled over themselves like thread on a spool. Their advantages? Well, apart from their suitability to close quarters, they have other advantages over single-coil torsions, notably—stress

is lower, or force is greater, or deflection is greater—assuming that the other two of the three factors are fixed in value. Then again, the double coil inspires a variety of pin locations to avoid interference... Why do we point all this out? Simply to indicate the complexities of spring design and specification. There is only ONE right spring for the job—the one made possible by science in springs.

IN THE ARMY NOW... Springs have gone to the front in a number of ways Hitlerito and his Nipponazis would like to know. If you need springs, or fighting equipment, our men will be only too glad to make them or design and make them. Just say when!



HUNTER PRESSED STEEL COMPANY, LANSDALE, PENNSYLVANIA

William C. Carter Heads Link-Belt Co.

• • • William C. Carter has been elected president of the Link-Belt Co., Chicago, succeeding Alfred Kauffmann, who is retiring due to ill health. Mr. Carter, who had been executive vice-president before this advancement, joined Link-Belt in 1902 as a draftsman and was subsequently named vice-president in charge of production. During the past year he has been in complete charge of the company's affairs due to the illness of the president.

Mr. Kauffmann has served Link-Belt as president for the past 19 years, having joined the organization some 41 years ago.

class B products may carry.

In order to discuss the procedural effects of CMP on the steel trade it is necessary to consider:

1. Prime and secondary consumers (of A and B products).
2. Warehouses.
3. Steel producing companies.

CMP will affect primary and secondary consumers in significant respects, as follows:

1. It will have to prepare bills of materials for submission to prime consumers or claimant agencies to aid in the development of over-all requirements budgets in accordance with the procedure established in CMP. No bills of materials need be prepared or submitted to any agency until requests for them are received from such agency.

2. It will have to prepare applications for allotments to purchase controlled materials using the proper form for submission to prime consumers or claimant agencies, whichever the case may be, in accordance with the procedure established in the plan. No applications for allotments need be prepared or submitted to any prime consumer or agency until requests for them are received from each prime consumer or agency.

3. Except for orders for fabricated products bearing AAA preference ratings, which under the plan take precedence over all conflicting orders whether or not accompanied by allotment numbers, the company shall have to accept and schedule for delivery where possible to do so, without conflicting with other orders previously accepted and accompanied by allotment numbers, all orders for fabricated products including class A and class B items.

4. As a prime consumer receiving an allotment of controlled materials the company is obliged to distribute

such allotment to cover the needs of its own production, as well as its immediate secondary consumers who in turn are obliged to distribute their respective part of the allotment in the same manner to themselves and to their respective secondary consumers. In no case, however, is it necessary to distribute an allotment to a producer of class B products.

5. As a secondary consumer, the company bears the same responsibility toward its prime consumers and its secondary consumers as the prime consumer bears to the claimant agencies and to it.

6. If the company has been granted an allotment of material, it may place orders for controlled materials with any producer or any other supplier of such materials. When purchase orders are placed, however, with mills producing steel products, they must be accompanied by three copies of a form properly filled in and executed by an authorized agent of the fabricating company.

7. It may place no authorized order for controlled materials until the appropriate allotment number is received and can be made to accompany the order.

8. The company will be obliged to submit estimates of its requirements of controlled materials for all maintenance, repair and operating supply needs in the same manner as is prescribed for all industries using CMP list materials.

9. The company will be obliged to submit estimates of its requirements of controlled materials for all maintenance, repair and operating supply

needs in the same manner as is prescribed for all industries using CMP list materials.

10. The company is obliged, if its inventory of all CMP materials is in excess of such limits as shall be specified, to submit to the Materials Redistribution Branch a statement showing the amount of inventory of all CMP materials in the forms on hand on the last day of each calendar quarter and consumption during that quarter. The first report is due Jan. 15, 1943, reflecting the condition as of the close of business Dec. 31, 1942.

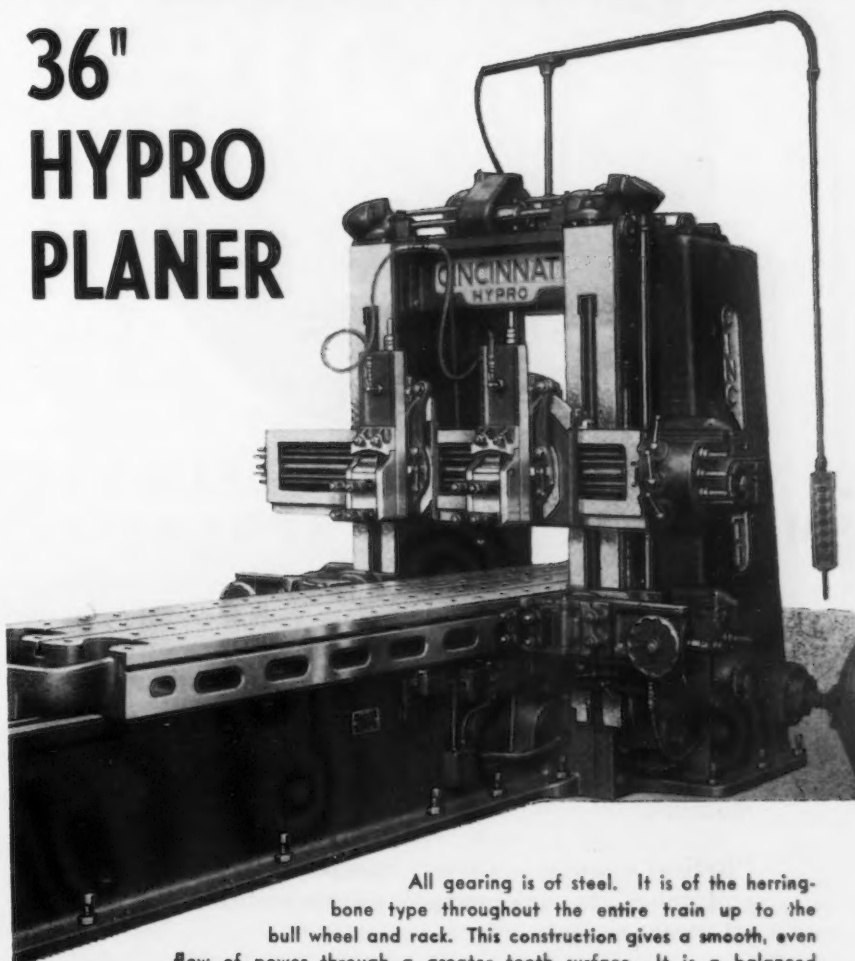
CMP will affect warehouses in significant respects, as follows:

1. It shall be required to fill customary warehouse orders bearing allotment numbers of controlled materials subject to quantity limitations yet to be prescribed.

2. It may be required to fill larger orders as specifically directed by the steel division or by a claimant agency from regular stock or from earmarked stocks which it may be required to maintain for exclusive use of the respective agency.

Cincinnati

36" HYPRO PLANER



All gearing is of steel. It is of the herring-bone type throughout the entire train up to the bull wheel and rack. This construction gives a smooth, even flow of power through a greater tooth surface. It is a balanced drive and produces no side thrust. Pinions are of heat treated alloy steel and the rack and gears are of forged steel. Write for Planer Bulletin 135.

FOR WAR PLANTS: Don't let Miss Jeanette Kirkamm interfere with your view of the new mirror glass reflectors being produced by the Westinghouse Lighting Div. to substitute for aluminum in yard light reflectors for war plants. This substitution is claimed to save 180,000 lb. of aluminum a year and provide 10 per cent more illumination.



PLANERS • PLANER MILLERS • BORING MILLS
THE CINCINNATI PLANER CO.
CINCINNATI, OHIO

3. The warehouse will be permitted to fill small orders, within a limit to be prescribed, without allotment numbers.

4. It will be required to report periodically to the steel division its shipments by claimant agencies in order to obtain allotments of steel to replenish inventory.

5. It will be obliged to submit estimates of its requirements of controlled materials for all construction and facility needs in the same manner as is prescribed for all industries using CMP list materials.

6. The warehouse will be obliged to submit estimates of its requirements of controlled materials for all maintenance, repair and operating supply needs in the same manner as is prescribed for all industries using CMP list materials.

Steel Producing Companies

CMP will affect a steel producing company in significant respects, as follows:

1. It will have issued to it each

month a production directive instructing it to produce specified tonnages each month of each product. This directive will be established on the basis of 95 per cent of the plant's expected production.

2. The company will be obliged to accept orders for shipment each month up to 110 per cent of the production specified in its production directive. This percentage is subject to such adjustment as may be necessitated by circumstances as they develop.

3. The company must notify the steel division of WPB each month when it has reached the 110 per cent tonnage booking for each product.

4. It must refuse orders tendered from the trade for shipment of any product in any month after such orders entered for shipment during that month total 110 per cent of the production specified in its production directive.

5. The steel mill must accept orders bearing allotment numbers in the order in which received, regardless of customer, provided the product specified is one which it produces.

6. Each order tendered the company must be accompanied by three copies of a form properly filled in and executed by an authorized official or agent of its customer.

7. The company must forward one copy of the form to the steel division indicating acceptance or rejection of each order tendered. This form must be sent to the steel division not later than the first day following entry of the order.

8. The company is obliged to give first consideration in its schedules to orders bearing allotment numbers under CMP even though other orders bearing high preference ratings open on the books carry over as unshipped tonnage from the first quarter to the second quarter for 1943. In respect to steel, no preference ratings, individual material allocations under "M" orders, or authorizations under the PRP, shall be valid with respect to delivery after June 30, 1943.

9. The mill may ship orders entered and designated for any one month after the 15th day of the preceding month provided such shipment does not interfere with shipments of orders covered by allotment numbers designated for shipment in earlier months, and provided such shipment does not cause violation of its production directive.

10. The mill must ship orders authorized for shipment in a particular month during the month specified if possible, but in any event not later than the last day of the following month. If shipment is not made as of this later date it must notify the steel division with respect to the order so that it can take such action as it desires.

11. After June 30, 1943, the company may make no shipment of mate-



Unequalled SURFACE SMOOTHNESS and SPHERICITY

The series of lapping operations performed as a matter of course in the Strom plant give Strom Steel Balls a degree of surface smoothness and sphericity that has always been unequalled in any other regular grade of ball. Only through such unique lapping practice can extreme precision be obtained.

Physical soundness, correct hardness, size accuracy, and sphericity are guaranteed unconditionally in all Strom Balls.

Other types of balls—*stainless steel, monel, brass and bronze*—are also available in all standard sizes. Write for catalog and prices.

Strom

STEEL BALL CO.

1350 So. 54th Avenue, Cicero, Ill.

The largest independent and exclusive Metal Ball Manufacturer



International News Photo

SCRAP TO BULLETS: These Hollywood eye-fuls, Elyse Knox and Grace McDonald are credited with the development of this wonderful machine which so aptly illustrates how scrap metal goes in here and comes out as shells and munitions.

rial except upon an order bearing an allotment number.

12. The company is required to report each month to the steel division on a proper form, shipments and past due orders classified by claimant agencies and in such other manner as may be prescribed by the controlled materials branch.

13. The mill will be obliged to submit estimates of its requirements of controlled materials for all construction and facility needs in the same manner as is prescribed for all industries using CMP list materials.

14. The mill will be obliged to submit estimates of its requirements of controlled materials for all maintenance, repair and operating supply needs in the same manner as is prescribed for all industries using CMP list materials.

WPB Will Add Five Claimant Agencies

Washington

••• WPB will shortly add five new agencies as claimants under CMP. These agencies have jurisdiction over food, transportation, petroleum, housing and rubber. The agencies are ODT, Agriculture, OPC, the rubber czar, William Jeffers and FHA. These agencies will get their requirements and send them to WPB. WPB will allot tonnages of controlled materials to these agencies.

WPB Regulates Electric Furnace Production

Washington

••• Producers of Electric furnace carbon steel were required by WPB on Monday to submit their melting and delivery schedules for approval in an amendment to Order M-21-A. Producers may not melt or deliver alloy iron, steel or electric furnace steel before such an approval is granted by the Board.

Previously, the order only applied to alloy iron and steel. However, because of the shortage of electric furnace capacity it has become necessary, WPB said, to control more closely the amount of carbon steel made in such furnaces.

At the same time, a new order, M-21-H, was issued establishing control of the production of carbon and alloy tool steels. Provisions in the latter orders relating to tool steel were revoked.

Check One— Pass Nine

This could be an unsafe practice, even in checking T & W forgings for uniformity . . . How "exact" do you want uniformity in heat treated forgings? There's no substitute for experience in heat treating forgings. Experience plus unwavering discipline in practicing a prescribed procedure for forming and heat treating forgings usually obtains the desired specified results from all the common commercial heat treatments . . . Consequently, it's not unusual to check ten, and pass ten, when checking T & W forgings for uniformity or physical structure, and that begets confidence. When you check one and pass nine forgings there's got to be a lot of confidence in the merit of the forgings and the source of supply. Ask a T & W Forging Engineer about checking heat treated forgings for uniformity.



FORGINGS

**USUALLY COST LESS
AT THE POINT OF
ASSEMBLY**

TRANSUE & WILLIAMS
STEEL FORGING CORPORATION
ALLIANCE, OHIO

Sales Offices: New York, Philadelphia, Chicago, Indianapolis, Detroit and Cleveland

More Steel May Mean More Freight Cars

Pittsburgh

••• Although the nation's railroads will probably only get the 20,000 freight cars allowed by the WPB for the first six months of 1943, it is more than an even gamble that during the last six months of that year the ante may be as high as 40,000 cars.

Due to the tightness of steel and other equipment, it is necessary to immediately figure on material requirements for the first six months' freight car production. Any loosening in the picture would probably affect freight car output in the last six months of 1943.

There is, however, definite evidence that railroads will get more rails, more track accessories, and more maintenance and repair ma-

terial than was indicated a month or so ago. This relief, however, will probably come when and as there is more steel available over and above direct war needs.

At present the real shortage in the freight car and railroad industries as far as car building and repairs are concerned lies with manpower, castings, and lumber rather than steel. Steel is still tight but on the other hand the shift to lumber on many items has placed this item at the head of the list as a critical item in 1943. There are some who believe that if WPB would thoroughly investigate there is more chance that ordinary carbon steels are more available in a relative sense than lumber for freight cars.

Meanwhile, the government's purchase of close to 40,000 cars is in the hopper and production is starting with the chance that it will take many months to complete this order. Manpower here will interfere at times with car builders and there is a chance that this condition will get worse before it gets better. Considerable pressure is being put on the government car building program.

The exceptional cooperation given the steel industry by the railroads and car builders in the matter of using odd sizes, sections, and taking "almost anything they could get" has in the past several months or so added to the potentialities of freight car production.

Production Award Given Athenia Steel Co.

••• The Army-Navy "E" production award was made to the Athenia Steel Co., division of National-Standard Co., Clifton, N. J., Dec. 14. This recognition is for outstanding service and production of thin high carbon precision strip steel.

Major Harold G. Hoffman, former governor of New Jersey, was guest speaker. Lieut. Col. W. J. McKiernan, A.C., and Lieut. J. Douglas Gessford, U.S.N.R., officiated in the presentation ceremony. Lieut. Willis J. Goedert, A.C., was master of ceremonies. W. H. Parkin, president of the company, addressed the workmen and their families. M. E. Murphy, eastern district manager, and John Dignam and Ernest C. Peterson, representing employees, received the award.

for PRODUCTION
despite difficulties

Use KENNAMETAL[®] tools



KENNAMETAL tools bore, face, and turn more pieces per tool and more steel per regrind than do ordinary carbides, especially when machining high Brinell steels and interrupted cuts.

KENNAMETAL'S greater hardness, greater transverse rupture strength, and greater modulus of elasticity permit it to efficiently complete the job illustrated at the left. This entailed machining a cast steel rack pinion (C. 25/.35; Ni 1.50/2.00; Cr .60/.90; 90,000 lbs./sq. in. tensile strength). It was necessary to turn, bore, and face over interruptions and sand holes; speed was 155 ft./min., feed .032", depth 1/4 to 5/16", using soluble oil coolant.

KENNAMETAL Grade KM was chosen for these operations and its performance was 5 to 1 over the tools previously used on this job.

Write for the new **KENNAMETAL** Catalog, No. 43, for complete information regarding these superior steel-cutting tools.

***Invented and Manufactured in U. S. A.**



McKENNA METALS Co.
144 LLOYDAVE., LATROBE, PENNA.

Foreign Sales: U. S. STEEL EXPORT CO., 30 Church St., New York
(Exclusive of Canada and Great Britain)

Trade Mark Reg. U. S. Pat. Off.

Albert Kahn, Famed Plant Architect, Dies

••• Albert Kahn, probably the best known industrial architect in the world, died Dec. 8 at his home in Detroit. He was 73 years old.

Born in Germany, Mr. Kahn was brought to this country at the age of 12. Entering architecture he was named architect for the Packard Motor Car Co. 39 years. He leaped into nationwide fame in industrial circles when he designed the Ford Motor Co. plant at Highland Park, a large building including all shops under one roof, in contrast to the then-orthodox style of separate shops in separate buildings.

From that point on Mr. Kahn did all the Ford construction work. With the advent of the first World War he was named official architect for the Aircraft Construction Division of the Signal Corps. After organization of the Chrysler Corp. he designed all that firm's buildings also.

In 1928 he was named by Russia to undertake supervision of construction work in the Soviet industrialization program. He built some 500 factories, including the tractor works at Stalingrad which have lately been a key point in the fighting for that city.

When the United States entered the present World War Mr. Kahn's office, known as the Albert Kahn Associated Architects and Engineers, Inc., expanded to approximately 600 persons. He built the Wright Aeronautical Co. plant at Cincinnati, Ohio, and the Willow Run plant of Ford Motor Co. As a memorial to his architectural genius, Kahn-designed buildings stand today on five continents.

It is estimated that the total construction he supervised came to more than \$2,000,000,000. In addition, he designed such office buildings as the General Motors Bldg., the National Bank Bldg. in Detroit.

New Rubber Plant Operates

••• Another government-financed synthetic rubber plant has begun production, in Kentucky, it is reported by John L. Collyer, president of the B. F. Goodrich Co. of Akron, Ohio.

United Nations Unite On Steel Production

Washington

••• A combined steel committee was appointed Monday by the combined Production and Resources Board and combined Raw Materials Board with representatives from the United States, the United Kingdom and Canada.

H. G. Batcheller, director of the WPB Iron and Steel Division, will be chairman of the committee and will be assisted by a staff of American, British and Canadian experts. The committee was instructed to recommend means of increasing steel output and obtaining the most efficient possible use of steel in the combined war production program in 1943.



EVERYONE'S JOB IS IMPORTANT

To insure steady completion of War machines, everyone's job is important, because it is the production of the raw materials, the machine tools and other machinery and parts that make possible the final assembly of tanks, guns, planes, ships and munitions.

MICHIANA Alloy Castings are doing their part in the foremost plants in the country,—their uniform high quality and long heat-hour service in-

surging maximum production at all times.

For heat-treatment purposes, for the furnaces, and the handling of the work in the furnaces,—you can rely on MICHIANA Alloy Castings. Our recommendations and assistance can save time for you and help you to perform still better your particular job in the war production program . . .



MICHIANA PRODUCTS CORPORATION, Michigan City, Ind.

660,000 Workers Frozen In Detroit War Jobs

• • • A job-freezing order affecting about 660,000 war workers in the Detroit area was announced last week by the War Manpower Commission as resulting from a mutual agreement with the workers and industry. Purpose of the order was to eliminate labor turnover and stop the migration from plant to plant in quest of higher

wages. Many workers outside of the metal working fields were affected including some agricultural, food processing and communication workers. The plan is based on a job-release principle which bars new employment to workers wishing to change from one plant to another.

Employers are not permitted to hire or solicit workers from other essential industries within the area unless the applicant has a

certificate of release from his past employer or from the review unit of the United States Employment Service.

Workers are permitted to move to jobs requiring greater skill if they are competent and their present employer is unable or unwilling to provide the advancement to utilize the workers skills to the utmost. Workers may also move to other jobs if the rate of pay by their employer is substantially less than the district level for the type of work being performed.

Employers are given 5 days to provide the higher skilled position required or meet the wage level or are required to issue a certificate of release. The worker may appeal to the review unit of the U. S. Employment Service; further appeal goes to the district War Manpower Committee. The review unit of the USES is also empowered to issue certificates of release when this is deemed expedient.



In all sincerity we wish you

A Merry Christmas

A Bright, Prosperous New Year

and an early peace that will be lasting and just

DEMPSEY INDUSTRIAL FURNACE CORPORATION
SPRINGFIELD MASSACHUSETTS

Buy War Bonds and Stamps



President Commands Monty-Ward to Sign

Washington

• • • President Roosevelt, for the second time, directed Montgomery Ward & Co. on Dec. 12 to sign a union contract containing the maintenance of membership clause as directed by the NWLB in their order of Dec. 8. The controversy between the NWLB and the company has resulted from NWLB insistence that the membership clause be included even though it violated a basic policy of the company. As a result the company would only agree to including the clause if they were permitted to insert another clause stating that the membership agreement was left in under "duress." Obviously the government would not accept this solution as no contract signed under duress is legal or binding.

Counter offer of the NWLB was that the clause requested by the company be altered to read "under protest" instead of duress. This however the company has steadfastly refused and requested that they be ordered to sign by the President if the NWLB order was in accord with his thinking. While the President had originally ordered the company to sign the

contract, this first command was before the company had suggested the "duress clause" and was not obeyed until this loophole was refused. The President has now settled all question of his wishes by again ordering the contract signed. The union involved was the Warehouse and Retail Employees Union (CIO).

WLB Decision Costs J. & L. \$3 Million

Pittsburgh

• • • The 30,000 wage-earning employees of the Jones & Laughlin Steel Corp. who come under jurisdiction of a recent directive order of the War Labor Board received retroactive pay last week in the amount of approximately \$3,000,000.

The retroactive pay is effective from February 15, 1942. Those

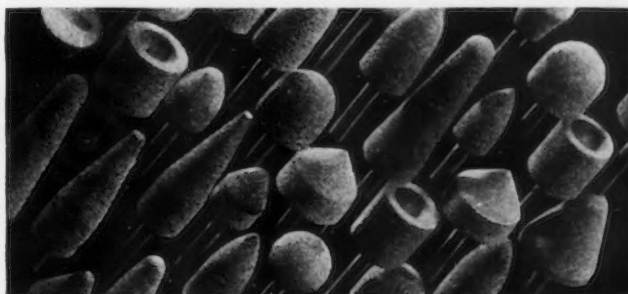
wage-earning employees of the Corporation who are covered by the order and are now in the armed services will receive back pay covering the period from February 15, 1942 to the date they last worked, after they have properly executed a simple form mailed to them by the company.

Other eligible wage-earning employees who left the employ of the Corporation after February 15, 1942 will receive the amount of

the increase up to the date on which their employment ended, provided they make application in writing within 60 days (prior to Jan. 31, 1943) to the paymaster at the works in which they were last employed as ordered by the board.

Certain salaried employees also will receive retroactive pay of \$10 per month from February 15 to August 31, 1942 inclusive and equitable salary increases will be made retroactive to September 1,

CALLED FOR ACTIVE DUTY ON THE PRODUCTION FRONT



We have a new job—to keep grinders going full blast all over the country in every war industry — in machine shops, tool rooms, experimental laboratories, repair departments, arsenals.

ATTENTION!

Our complete facilities are now devoted to making CHICAGO Mounted Wheels and Vitrified Grinding Wheels 3" and under in diameter. We're proud and happy to be given this definite and important part in the War Program. Our work goes on night and day supplying these vital aids for Victory.



Send us your priority orders for mounted and unmounted grinding wheels up to and including 3" in diameter. You will get the right wheel for the job—when you want it.

We no longer manufacture the larger grinding wheels. We're sorry to have to disappoint our good customers (many of whom have been with us for half a century) on their orders for Vitrified Wheels over 3" in diameter.

Specializing on high production of Mounted Wheels, Cut-off Wheels and small Vitrified Grinding Wheels will be our job until the war is won. We know you will understand.

YOU SHOULD HAVE OUR NEW CATALOG

It shows in actual colors and exact sizes the most complete line of Mounted Wheels made. Send for copy today.

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America's Headquarters for Mounted Wheels.
Established 1896.

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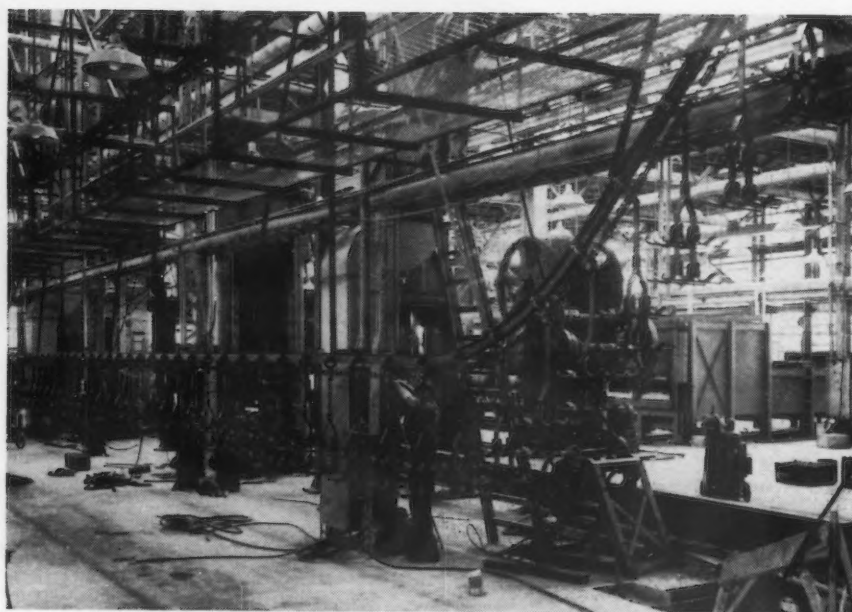
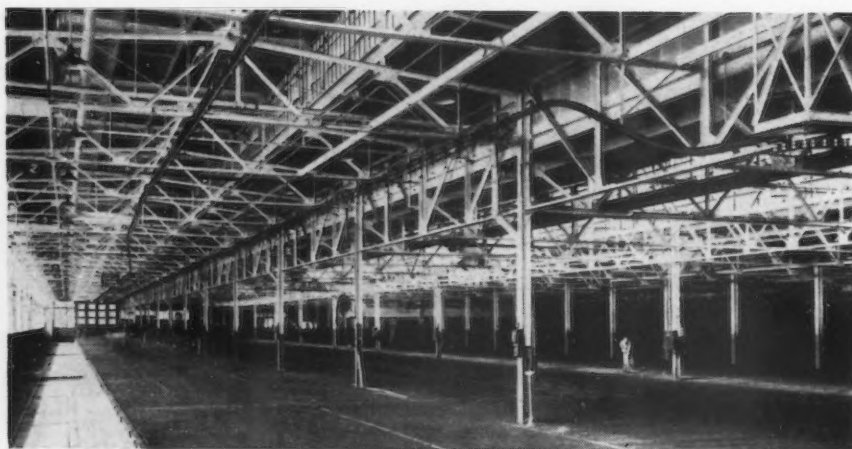
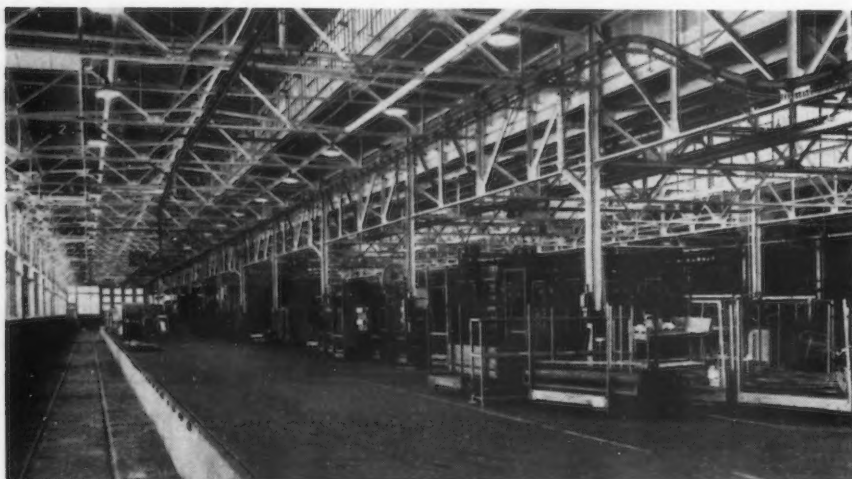
Please send new Chicago Wheel Catalog

RA-12

Name

Address





A PLANT GOES TO WAR: These three photos illustrate the stages in the conversion of a plant to war production. This plant was formerly the scene of the assembly of Oldsmobiles by General Motors. The first view shows the plant as it looked when assembly was halted. Then follows the barren plant which was immediately filled with the monorail conveyor and other equipment necessary to Army ordnance production.

Strike Idleness At 5-Year Low

Washington

• • • OWI announced this week that man-days lost due to strikes since Pearl Harbor have dropped to the lowest level in the last five years. This fact is exceedingly interesting in view of the greatly increased total of employment.

While average monthly employment totals have risen from 30,545,000 in 1937 to a 1942 average of 36,621,000 the average number of man-days lost due to strikes has fallen from 2,369,000 to 397,000.

1942. These retroactive salary payments will be made on December 18, 1942.

Bethlehem Turns to Newspapers for Labor

Buffalo

• • • For the first time since the war began, the Lackawanna plant of the Bethlehem Steel Co. has resorted to display advertising in Buffalo newspapers in an effort to attract workers. In its initial big ad, Bethlehem appeals for general workers immediately, and also says it has many positions open for skilled workers.

WMC Appoints Local Labor Board

Cleveland

• • • A Labor-Management Committee on war manpower was appointed to function as an official agency of the War Manpower Commission in formulating and putting into effect a labor stabilization program for the industrial area of Cleveland and is expected to act by the first of next week.

The members appointed to the board were: William F. Donovan and A. E. Stevenson (CIO); William Finegan and Thomas A. Lenehan (AFL), and representing management were, H. P. Ladds, president of the National Screw & Mfg. Co.; A. C. McDaniel, president of Hill-Acme Co.; Charles J. Stilwell, president of Warner & Swasey Co., and Albert S. Rodgers, president of White Sewing Machine Co. The

committee is headed by Dr. William P. Edmunds, Cleveland area director of the War Manpower Commission.

The committee will decide, pursuant to instructions from Paul V. McNutt, chairman of WMC, the classes of war workers to be hired through the U. S. Employment Service, how the changeover of men and women from non-essential to war jobs can be facilitated, how migration of labor into the area can be controlled, the extent of war industry training programs, and how women not now in the labor market can be induced to take jobs in war industries.

One Day Strike Ends At Wright Aeronautical

Paterson, N. J.

••• The 165 workers at Wright's East Paterson plant who went on strike Dec. 8 have returned to work pending mediation of their controversy. The strike, which only lasted one day, was said to have been caused by a six-day work schedule for women which the union claimed was being enforced so that women would be caused to work Sundays at time and a half when men would normally draw double time. The company contends the work schedule is required by State law.

48-Hour Week for Federal Employees Gets Approval

Washington

••• It was made known this week that the Senate Civil Service Committee has approved legislation authorizing the employment of government workers on a 48-hour week basis with a commensurate increase in salary.

Eastman Predicts Need Of Transportation Industry

Washington

••• Grave concern over the domestic transportation system's manpower crisis was expressed this week by Joseph B. Eastman, ODT director.

Eastman predicted that, on the basis of recent surveys, the transportation industry would have to find and train by midsummer, 1943, approximately half a million new workers. These new employees must be obtained, he said, if the industry is to continue to perform its

job in the war. The ODT director advanced a three-point program of recruiting, training and more efficiently utilizing labor to man the country's trains, buses, trucks, airplanes, street cars and other carriers.

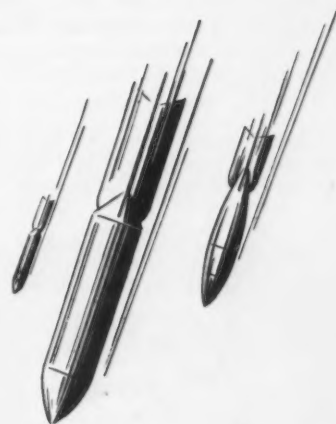
The programs of recruiting and training in the transport industry must take into account the seniority principle and the upgrading process followed in the transportation system. Under these policies,

promotion and grading of employees depends to a considerable degree upon comparative service records. Much of the new labor must be common labor hired at the bottom of the industry's scale. Pre-employment and on-the-job training, Mr. Eastman said, thus is required to man the industry from the bottom up, through the up-grading process.

He indicated that in some instances hours of work could be

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- for greater output
- better painting
- savings in critical materials in the production of



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DEOXIDINE's ability to eradicate rust chemically has been long recognized. In the munitions industry today, as in the sheet metal industry in the past, it eliminates laborious hand operations for rust removal, speeds production, and leaves metal surfaces prepared properly to receive paint.

Pickling provides a quick, easy and economical method of re-

moving scale, and this operation is made safe and efficient by the addition of RODINE, the acid inhibitor, to the pickling bath.

The ACP Alkali Cleaning System utilizes RIDOLINE in spray or dip method to speed production . . . followed by diluted DEOXYLYTE to counteract alkalinity. Critical materials are conserved for more important uses by substituting this ACP Process.

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ETNA

They had a job of pointing heavy-walled copper tubing, and wanted to speed up the operation. Just how to do it didn't appear on the horizon, and so Lewin-Mathes did the safe and logical thing—they put their swaging job up to Etna.

The answer to that problem is illustrated on this page. It's a modern Etna Swaging Machine that points *more* copper tubes per hour in less time at less cost. If you have a problem involving tapering or reducing tubing and solid rounds—ask Etna about it.

Etna has the swaging machines from $\frac{3}{8}$ " to 4" and the experience to help you get the most out of this type of machine.

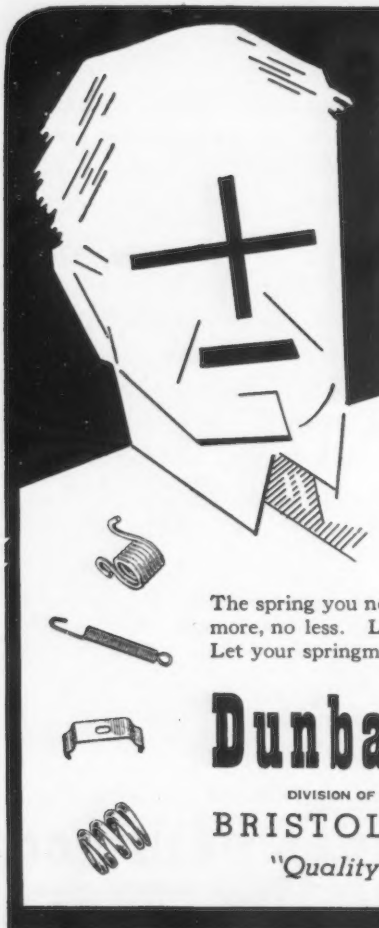


IF IT'S A QUESTION OF TAPERING, SIZING OR REDUCING OF ROUND SOLIDS OR TUBING...

"Ask ETNA About Swaging"

ETNA

MACHINE COMPANY
TOLEDO OHIO



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"Quality Springs Since 1845"

MANPOWER

lengthened further without detriment to employees but pointed out that, for the most part, the industry already operates under a standard 48-hour week and that, in addition, overtime has increased considerably.

Unions to Poll At Wright

• • • The NLRB has ordered the Wright Aeronautical Corp. to conduct elections within the next thirty days to determine collective bargaining agents for their six plants in the Paterson, N. J., area, it was announced this week.

The collective bargaining privileges have been hotly sought by both the CIO and the newly formed Aircraft Workers of America, an independent group recently formed after the abandonment of the former company union.

Bethlehem Strike Ends After One-Day Delay

Johnstown, Pa.

• • • Philip Murray's request that their grievance be settled by arbitration sent 3000 CIO members at several Bethlehem plants here back to work Dec. 9 after a one-day walkout. The grievance arose from a work schedule which the union claims never permits Sunday to fall on the seventh consecutive day which would entail double time pay. The company stated that double time was being paid. The strike had closed several departments which were making plates for warships.

WLB Laxity Hinted in Bohn Aluminum Strike

Detroit

• • • Impatient with the delay in approving or disapproving their application for a wage increase by the WLB, 1900 employees of the Bohn Aluminum and Brass Co. here walked off the job in spite of the union's appeal that they return. The appeal for continued work was made by Fred Williams, local president of the UAW.

Intimation of WLB laxity was held in the statement of Stephen Denuyl, secretary-treasurer of the company, who said that following a union-company agreement on an increase he had made a trip to Washington for advice and as a

MANPOWER

result sent a letter, signed by both the company and the union, to the War Labor Board. Later the local WLB office advised that applications must be made on Form 10 and one copy of the form was furnished. Mr. Denuyl said 27 copies were needed to make the application in a legal manner and that he understood the WLB did not have that many copies available.

Warehouses to Get Manpower Assistance Washington

• • • The Office of Defense Transportation and the Storage Manpower Committee, recently created by ODT, will distribute to the warehouse industry information designed to aid the industry in meeting manpower shortages, it was announced this week.

The informative materials, which will be prepared by ODT and distributed throughout the industry by the committee, will include a discussion of selective service procedure, an explanation of war manpower commission organization, and suggestions for the utilization of federal recruiting and training programs.

WMC to Include Selective Service Washington

• • • Establishment of a Bureau of Selective Service within the War Manpower Commission was announced this week by Paul V. McNutt, chairman of the commission. "Major General Lewis B. Hershey, as director of Selective Service, will act as head of the new bureau, subject to the direction and supervision of the executive director of the commission," Mr. McNutt said.

"This organizational arrangement will assure close co-ordination of the twin wings of the commission charged with meeting the needs of war manpower—selective service for filling military requirements and the U. S. Employment Service for handling civilian production requirements," Mr. McNutt said. "It also permits the selective service organization to continue its present functions and duties without change, subject to the direction and supervision of the executive director."

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NON-SHATTERING HIGH SPEED STEEL BLADES

Use of Tinplate for Food Packs Cut; Can Sizes Set

•••The extent to which critical materials such as tin and steel can be used for cans during 1943 was set forth Dec. 10 by the WPB with issuance of Order M-81, as amended. The order (1) limits the use of tinplate, terneplate and blackplate for packing food and non-food products in cans; (2) specifies the can sizes which may be used for each product; and (3) establishes packing quotas for all the items covered.

The order does not differ substantially from provisions of M-81 as they have operated during the past year. Generally, these provisions have been tightened up and have been made more inclusive to accomplish the primary objective of conserving tin, steel and rubber used in the can industry. The major changes are these:

1. Tinplate, terneplate and blackplate are prohibited for packing a number of products previously put in cans made of these critical materials.
2. Many other canned products which previously could be packed in metal cans for both military and civilian use are now limited for government purchase only.
3. A few products are added to the list of items permitted to be packed in cans.
4. Some quota restrictions are lifted and others are sharply curtailed.
5. A number of can sizes are eliminated for specified products in fulfillment of the policy that odd size and intermediate type containers not be used in

the interests of efficiency and conservation.

6. Tinplate coating specifications are reduced for several products, with increasing emphasis on chemically treated blackplate and electrolytic tinplate, both of which result in the conservation of tin.

The appended schedules to the order listing products permitted to be packed in metal cans together with packing quotas, can sizes and tinplate specifications remain substantially unchanged.

Schedule I specifies the amount of tinplate, terneplate and blackplate which may be used for canning food products for both civilian and government use. Where M-86 is mentioned, cans may be used for packing only the quantity of products required to be set aside by that order for government purchase. (M-86 is issued concurrently with the Dec. 10 order.)

Schedule II imposes limitations on the use of cans for food products for civilian consumption only. Schedule III, covering metal cans for non-food products, establishes quotas for civilian use only.

Following is a summary of the most important changes and additions effected by the amended order:

Products which were formerly permitted

to be packed in tinplate, terneplate and blackplate for civilian use but which now may be packed for government purposes only include such common household items as: vegetable juice mixtures, meat spreads, cranberries, orange and grapefruit segments combined, California freestone peaches, prunes, fruit for salad, carrots and peas, sauerkraut, and baking powder.

Shoe polish cannot be packed in metal cans after March 31, 1943.

Paints and pigmented lacquers may use blackplate only for can ends until Feb. 15 when a complete conversion to substitute containers must have been made.

Varnishes, lubricating oils, disinfectants, germicides, fungicides or insecticides and certain other products will not be packed in metal cans after Dec. 31.

Likewise eliminated for civilian use are these products which may be packed in tinplate, terneplate and blackplate cans only to meet M-86 quotas or for government contracts.

Can packs of certain products for civilian use are sharply cut under the 1942 pack. Canned soups are restricted to 50 per cent of the 1942 pack. Prunes, printing inks and lye are similarly restricted to 50 per cent of the 1942 amount. Spinach and green leafy vegetables will be canned at 80 per cent of the 1942 pack. Baby foods (as defined in Schedule II) can be packed in cans in an amount equal to the 1942 pack.

Evaporated milk, packed in 14½-ounce cans, is cut 10 per cent below the 1942 pack, while, if packed in 6-ounce cans, it is cut 20 per cent below the 1942 pack.

Quota restrictions on packing the following products in cans have been lifted completely for 1943: pineapple, pineapple juice, grapefruit juice, freestone peaches (except California), soft clams, hard clams, mussels, oysters, shrimp and squid.

Tinplate coating specifications are changed for many items, with electrolytic to be used for packing specified vegetables, fish and meat products. A comprehensive study of the use of large size cans is now under way.

MACHINIST, 63, RECEIVES CITATION: President Roosevelt is shown presenting a citation for valuable suggestions to war production to 63-year old Joseph H. Kautsky of the Link-Belt Co. Others in the picture are, standing, left to right, Clinton R. Hanna, Edwin Curtiss Tracy, Stanley Crawford, James A. Merrill, Daniel W. Mallett, Donald M. Nelson.

Harris and Ewing



CMP Pooling Plan Studied

New York

•••Plans are reported being worked out under CMP to permit manufacturers producing the same or a similar product for either several claimant agencies or for several prime contractors to pool the material authorized on the allotment number on their contract. Several difficult problems remain to be solved, however.

Growth of the Class B list is causing concern in some governmental quarters. It is feared the efficiency of CMP may be impaired if the list keeps growing.

Pens, Pencils Are Hit

•••WPB on Dec. 7 cut production of pens and pencils and at the same time banned the use of critical materials wherever possible in their manufacture. The order (L-227) affects fountain pens, mechanical pencils, ordinary

wood-cased pencils, pen holders, and pen points. Production of all these is cut, except pen points. Primarily to meet export requirements, production of pen points next year will be stepped up 85 per cent over 1941. No metal of any type will be allowed on wood-cased pencils or pen holders (not including fountain pens). Platings, coatings, or other metal finishes, containing zinc, tin, cadmium, copper, or nickel for use on any type of pen or pencil are completely banned.

WPB Personnel Changes

••• **B. C. Heacock**, chairman of the executive committee of the Caterpillar Tractor Co., Peoria, Ill., has been appointed as Director of the Priorities Control Division of the WPB Distribution Bureau. Mr. Heacock's division is charged with the responsibility of integrating the PRP, and the priorities system as a whole, with the CMP; implementing determinations of the Requirements Committee; processing applications for special and emergency ratings; and clearance of WPB orders.

••• **Appointment of William M. Robbins**, Greenwich, Conn., as assistant deputy director general was announced Dec. 7 by Deputy Director General H. W. Dodge, who is in charge of staff functions in the office of the WPB Director General for Operations. Mr. Robbins is vice-president of the General Foods Corp. and president of General Foods Sales Co., Inc.

Appointment of **Arthur S. Knoizen** as director of the WPB mining equipment division was announced Dec. 2 by Ernest Kanzler, Director General for Operations. He is on leave of absence from the Joy Mfg. Co.

Ralph J. Cordiner of Schick, Inc., has been appointed WPB Director General for War Production Scheduling.

Aluminum Shipping Order

••• **Persons desiring** to make emergency shipments of aluminum products prior to the month of normal allocation must now secure a written statement of approval from the military procurement officer having jurisdiction over the contract for which the material is intended, it was announced Dec. 8 by the WPB.

Aluminum producers, foundries, and fabricators have been notified that emergency requests for permission to deliver aluminum products will be granted only in cases where delay in delivery would interfere with an authorized military program.

Previously, under the terms of Order M-1-i, form PD-26A, requesting permission to deliver "emergency" items, could be filed with WPB at any time. According to the Aluminum and Magnesium Division, numerous unnecessary emergency requests have been made.

The PD-26A form used in emergencies is identical with and supplemental to the regular PD-26A, which is filed 45 days preceding the beginning of a month in which deliveries are scheduled.

Hereafter, the supplemental PD-26A's will not be approved unless the statement from the military procurement officer is attached. Such statements must show:

1. Why the order was not placed on the original PD-26A 45 days prior to the allocation month.
2. What specific damage to the war effort will result if the item involved is not delivered until the next allocation month.
3. A certification that absence of emergency delivery will result in failure to meet the authorized objective for the final end product for which the aluminum is intended.

A similar statement signed by an executive officer of a company requiring the aluminum must accompany emergency requests for essential civilian requirements permitted by Order M-1-i.

Order L-1-g Amended

••• **Manufacture of 300** semi-trailer petroleum tanks to help relieve the oil shortage in eastern states is provided for in Supplementary Limitation Order L-I-g as amended Dec. 10. Each will hold about 4,000 gallons.

Order L-146 Revoked

••• **The limited control** of the distribution of welding rods and electrodes effected by General Limitation Order L-146 was abandoned on the issuance Dec. 6 of a revocation of L-146. When intended purchasers of welding rods and electrodes for maintenance and repair work find it necessary to obtain

preference ratings, applications for purchases of less than \$50 should be addressed to local offices of the WPB. Where more than \$50 worth of material is wanted the applicant should obtain approval from the Director General for Operations in Washington.

Calcium Carbide Controlled

••• **Calcium carbide** was placed under allocation control, effective Jan. 1, through issuance of General Preference Order M-190. Deliveries are prohibited without specific authorization except in the case of monthly shipments of 10 tons or less.

Effect of Ordnance Cuts on Small Plants Seen Minimized

Chicago

••• **Every effort** will be made to minimize the effect of the recent shift in arms production on the small plants, Maj. Gen. L. H. Campbell, Jr., army chief of ordnance, told a press conference here last week. The output shifts will be felt most by the larger firms, the ordnance chief said.

"We are going hammer and tongs at the problem of keeping the little producer in the war," Gen. Campbell asserted, "for we must not tear down the country to win the war."

Whatever hardships result from the shift in production will be temporary, he said, adding that there "will be no widespread cancellation of contracts. The effects of the change will be felt less in the Chicago district than in others.

The full effect of the revamped war production program will be felt by contractors in the Chicago district within the next 30 days, the general said. Cancellation orders will be issued for such items as bombs, shells, tanks and certain artillery units. Such cancellations, however, are being made only to obtain more facilities and material for greater production of ships and aircraft.

The necessity of such revisions is due to the "fluidity of war," Gen. Campbell said, "Things we thought we would need in one phase of the war in great quantities, we may need in lesser quantities during the following phase."

This Week's Priorities and Prices

Persons desiring to make emergency shipments of aluminum products prior to the month of normal allocation must secure a written statement of approval from the military procurement officer having jurisdiction over the contract for which the material is intended. (T-1351)

Use of steel in production of pens and mechanical pencils is limited to low carbon steels for functional parts and stainless steel for pen nibs, under order L-227. (WPB-2218)

Oil well pumping units are removed from the list of items in which the use of steel is prohibited by order M-126, amended Dec. 5. (T-1352)

Iron and steel products jobbers, dealers and distributors are informed that the recently imposed 3 per cent tax on transportation is to be treated as though it were a freight rate increase. (OPA-T-388)

Calcium carbide was placed under allocation control effective Jan. 1, under order M-190. (T-1359)

■ ■ ■

For copies of above announcements address Office of War Information, Washington, giving announcement number as shown in parentheses after each paragraph. (For example, WPB-600 means announcement 600 issued by the War Production Board.)

Revisions to The Iron Age Priorities Guide

• • • The following data, together with all intermediate weekly revisions in **THE IRON AGE**, should be added to **THE IRON AGE Priorities Guide** published with the issue of October 8 to bring the Guide up to date.

"L" Orders:

L-5-c... Amendment (12-8-42) rules that Defense Supplies Corp. is the only RFC subsidiary to which domestic mechanical refrigerators can be sold without specific authorization.

L-146... Revoked (12-9-42).

L-208... Interpretation No. 1 (12-8-42) states that order only applies to machinery in mines which were operating on or subsequent to Sept. 17.

L-227... Order cuts production of pencils and pens and bans the use of critical materials wherever possible in their manufacture (12-7-42).

L-236... Schedule I (12-9-42) orders simplification of builders' hardware.

"M" Orders:

M-44... Revoked (12-9-42).

M-81... Amended order limits use of tin and steel in cans (12-9-42).

M-126... Amended order frees steel for oil well pumping units (12-5-42).

M-190... Order places calcium carbide under allocation control (12-9-42).

"P" Orders:

P-130... Amended order grants higher preference ratings to telephone companies for repair and maintenance (12-9-42).

L-221 Amended

Washington

• • • To clarify possible misunderstandings regarding the dead line for deliveries of electric motors and generators, Order L-221 was amended last Friday by WPB to establish Feb. 1, 1943 as the date upon which restrictions on deliveries of electric generators and motors become effective.

Changes in PRP

Washington

• • • Changes in the method of authorizing PRP units to purchase steel, copper, aluminum and magnesium during the first quarter of 1943 were announced last Friday by J. A. Krug, WPB Deputy Director General for Distribution. The revisions are designed to ease the transition from PRP to the CMP system.

Ratings will be assigned on PD-25A for copper and alloy steel in the forms listed on PD-25A, but provision is made for the acceptance of amounts in excess of those to which ratings are assigned on the PRP certificate if Copper or Steel Divisions approve the deliveries.

Purchases of magnesium and aluminum in the mill shapes listed on form PD-25A will not be rated or authorized on this form when it is returned to the applicant. Manufacturers requiring these materials, may, however, place their orders with their suppliers which will then apply to WPB's Aluminum and Magnesium Division for approval of proposed shipping schedules. This change does not affect fabricated items purchase of which will be rated and authorized as heretofore.

M-21-d Interpreted

Washington

• • • Orders for corrosion and heat resistant steel, if approved on Form PD-391, can be completed even if rated lower than AA-5, it was made clear last Friday by an interpretation of Supplementary Order M-21-d.

The M-21-d order restricts delivery of corrosion and heat resistant steel to AA-5 or higher-rated orders. The interpretation points out that this restriction does not apply to orders authorized by Form PD-391 (submitted under Order M-21-a.)

E-2-b Amended

Washington

• • • An amendment was made last Saturday to General Preference Order E-2-b which permits a purchaser to obtain preferential delivery of certain special cutting tools up to the lowest quantity that can be efficiently produced by the manufacturer. The amendment changes the former restriction which limited the purchaser to three sets of special cutting tools and provides that the purchaser may now accept deliveries of the "producers minimum practicable manufacturing quantity." Where the quantity is less than three sets of special tools, the purchase may be extended to this amount. In no event, however, can the purchaser obtain more than a 90-day inventory. A provision also was made for freeing purchasers of cutting tools from the necessity of filing an endorsement, where they are delivered with a larger machine to make it usable and are acquired under an authorized purchase order. Another provision makes hard alloy blanks or tips subject to the provisions of the original order, whether or not attached to a tool shank.

OPA Sets Packaging Extras; Issues Other Steel Rulings

New York

••• An OPA-approved table of extras as maximum charges for packaging iron or steel sheets has been issued within the past month. It is printed in the adjoining table.

The government price control division also has issued a number of rulings affecting steel quotation methods. It has ruled that on carload sales of merchant wire products, except nails, which are made to government procurement agencies, discounts shall be those made to jobbers for direct shipment to jobber's customers.

Unusual storage and demurrage charges on export and lend-lease business may be included by sellers in the final selling price. Shipments sold on an FAS seaboard basis but later sent to a non-seaboard place must be repriced on the basis of the emergency or the governing basing point.

In connection with ODT Order No. 18, OPA has advised producers that since steel products are shipped only under allocation or priority, shippers may claim exemption from the loading requirements of the order in all cases where they are reasonably sure that such limitations are the actual cause of the inability to ship a capacity carload.

Producers must absorb the new 3 per cent freight tax at all arbitrary points, such as the FAS seaboard prices, Detroit, Gulf and Pacific Coasts, etc., and the delivered zone prices for wire rope, rigid conduit, etc.

Section 1306.10 (g) (2) of Schedule 6 as set forth in Amendment 6 does not apply to rail steel reinforcing bars.

It is permissible to use trucking rates instead of rail rates in calculating maximum delivered prices under the following circumstances:

(a) Delivery is actually made by truck and the necessity for truck delivery originates in circumstances beyond the control of the producer, such as ODT regulations, lack of a rail siding at point of delivery, or a direct request by the customer;

(b) When delivery is made to any point where freight absorption would be required by Revised Price Schedule No. 6, the normal absorption which would arise on a rail shipment must be absorbed by the producer when shipment is made by truck and any transportation charge in excess of this amount may be added to the maximum delivered price: Provided, that when delivery is made from a mill located within a basing point area for which there is an arbitrary rail switching charge to a customer within the same switching area, the actual trucking rate may be substituted for the arbitrary switching charge in calculating the maximum delivered price; and

(c) Nothing in this interpretation shall be construed as eliminating, limiting, or otherwise affecting the application of Section 1306.10 (i) of Revised Price Schedule No. 6 under which producers are required to maintain all customary or general privileges in effect as of April 16, 1941.

Telephone Engineers Asked to Save Materials

Washington

••• Materials used in telephone installations and in the operation of telephone systems are critically scarce because of the increasing need of them in carrying on the war, communications companies are advised in a bulletin addressed to them by Leighton H. Peebles, director of the WPB Communications System, who recommends greater use of "bridged" telephones; acceptance of slower service standards; determination of the amounts and nature of traffic loads by analyses of the calls handled with a view to limiting personal and nonessential business calls; studies looking to the shortening of telephone conversations.

Air Freight Problem Examined by SAE

Chicago

••• While the development of cargo transport by plane has been hastened by the war, there is a tendency to exaggerate the possibilities of air freight, members of the Society of Automotive Engineers were warned last week by speakers at the society's air cargo engineering meeting at the Knickerbocker Hotel here.

In considering the part aircraft will play in world and domestic commerce tomorrow, the present attitude toward the cost item in such transportation will be reversed, J. V. Sheehan, manager of industrial research for Lockheed Aircraft Corp. warned. This item will then be of paramount importance, he said.

"It is our belief," Sheehan asserted, "that the airplane potential in the over-all transportation scheme is of a supplemental nature, and not one to replace the railroads and steamships. The airplane's ability to carry its part of the immense total tonnage is too sound to be jeopardized by wild claims."

Col. H. R. Harris of the army air transport command reported that army world air routes total some 60,000 miles, as compared with a prewar total of 41,000 for all domestic air lines. In one recent month, he said, the air transport command's ton-mileage was larger than the combined totals of all the air lines in the United States during 1941.

Col. Harris pointed out that a limiting factor in the establishment of military air lines (as well as for commercial airline development after the war) is gasoline to power the planes and the fact that refueling operations cannot be efficiently performed in the air.

Deliveries Improving

Birmingham

••• Steel deliveries in the Birmingham district seem to be improving on the basis of actual need. This does not mean that requirements for any items can be filled at any time, however. It means rather that more critical materials are being delivered nearly as scheduled.

PACKAGING EXTRAS—ALL TYPES OF IRON OR STEEL SHEETS

Type of pkg.	Weight per Package					
	6000 lb. & over	4000 lb. to 5999	2000 lb. to 3999	1000 lb. to 1999	500 lb. to 999	Under 500 lb.
SECURED PACKAGES						
Securely wired or banded .....	..	..	..	10c.*	20c.	40c.
EXTRAS FOR SPECIAL PACKAGING (Charged in addition to the above)						
Waterproof paper .....	..	..	5c.*	5c.	10c.	20c.
Wooden skids .....	..	5c.*	5c.*	5c.	15c.	30c.
Unbent waster sheets top and bottom..	5c.*	5c.*	5c.	10c.	20c.	40c.
Metal containers or bent waster sheets	5c.	10c.	10c.	20c.	40c.	80c.

*Applicable on export sales.

Note—When a charge for packaging is included in the base price, it shall be deducted before adding above extras.

PERSONALS

• **Charles L. Huston, Jr.**, director of personnel relations of Lukens Steel Co., Coatesville, Pa., and a member of the company's Board of Directors, has been appointed Assistant to the President of the company, according to an announcement by Robert W. Wolcott, President.

Mr. Huston joined Lukens as Director of Personnel Relations in September, 1939, after serving ten years with the American Rolling Mill Co., Middletown, Ohio. With the latter concern, he spent five years in the Metallurgical Department and five years on the company's personnel relations staff in public relations, employment and training work. At the time of his resignation to join Lukens, he was Assistant Staff Supervisor of Employment and in charge of introductory training.

Mr. Huston was born in Coatesville in May, 1906, where he attended grade school and graduated from the Hill School in Pottstown, Pa., in 1924. He graduated from Princeton University with a degree of Bachelor of Science in 1928 and spent the following year doing special studies in metallurgy at Massachusetts Institute of Technology, going from there to the American Rolling Mill Co.

Mr. Huston is a member of the Industrial Relations Committee of the American Iron & Steel Institute and a member of the Association of Iron & Steel Engineers. He has recently served as a special mediating officer for the National War Labor Board. He is a member of the American Branch of the Newcomen Society of America, of the Executive Committee of the Chester County Council of the Boy Scouts of America, and of the Board of Managers of the Coatesville Hospital. His clubs include: the Delta Psi Fraternity, the Princeton Club of Philadelphia, the Quadrangle Club of Princeton, Merion Cricket Club of Haverford, and the Coatesville Country Club.

• **Frederick C. Crawford**, president of Thompson Products, Inc., an official of many commercial and industrial associations, was elected to the presidency of the National Association of Manufacturers at the association's annual convention in New York, Dec. 3.



C. L. HUSTON, JR., assistant to the president, Lukens Steel Co., Coatesville, Pa.



A. R. ABELT, director of Baldwin-Duckworth Division, Chain Belt Co.

In 1916, two years after his graduation from Harvard, he became associated with the company which ultimately became Thompson Products, Inc., and has been president of his company since 1933 and of the Thompson Aircraft Products Co., a subsidiary.

• **Ralph Strang** has recently become head of the sales engineering department for Morey Machinery Co., Inc., of New York City. Previous to this connection, he was chief of the research service unit, Facilities Branch of the WPB. Prior connections include

the Warner & Swasey Co. as European sales director and the Gisholt Machine Co.

• **Raymond S. Livingstone** has been elected vice-president in charge of personnel of Thompson Products, Inc. He has been personnel director of the company and its subsidiaries since 1934 and will continue in his capacity of directing employment, industrial training, labor relations, employee publications, and the social and athletic activities of more than 16,000 war workers in plants in six cities.



RALPH STRANG, head of sales engineering department, Morey Machinery Co., Inc., New York.



RAYMOND S. LIVINGSTONE, vice-president of Thompson Products, Inc., Cleveland.

• **A. R. Abelt**, secretary of the Chain-Belt Co. since 1930, has been elected a director to replace F. J. Weschler of the Baldwin-Duckworth Division, who died last month. In addition to being made a director of the company, he has also been elected a vice-president. Mr. Abelt joined the Chain-Belt organization in 1907 and has served it in many capacities which have included production, sales and executive work. G. D. Gilbert, sales manager of the Baldwin-Duckworth Division of the company, Springfield, Mass., has been made general manager of that division and also elected secretary of the company to succeed Mr. Abelt.

• **C. R. Dobson** has been appointed chief industrial engineer, Jones & Laughlin Steel Corp., under the vice-president in charge of operations, S. S. Marshall, Jr. He



C. R. DOBSON, chief industrial engineer, Jones & Laughlin Steel Co.

succeeds **Lauson Stone** who has resigned. Mr. Dobson started with Jones & Laughlin in their South Side works in 1920 upon his graduation from the Carnegie Institute of Technology as an industrial engineer. Since 1930 he had been assistant to Mr. Stone.

• **Martin A. Hotham** has been appointed production engineer of the Follansbee Steel Corp., Follansbee, W. Va. Mr. Hotham has spent his entire career in the steel industry, going to Follansbee from the American Tube & Stamping Co., Bridgeport, where he super-

vised steel production and open hearth operations.

• **Alvin A. Borgading**, assistant to the purchasing agent of American Car & Foundry Co. since 1939, has recently been appointed purchasing agent for the company. **Herbert Streader** has been named assistant purchasing agent and placed in charge of the Material Control Division set up under WPB's Controlled Materials Plan.

• **George J. Taylor**, industrial lighting engineer at General Electric's Nela Park, has been promoted to the post of wartime lighting engineer at the company's Atlantic Division, New York. Devoting the past two years almost entirely to wartime industrial lighting, Mr. Taylor has traveled some 150,000 miles throughout the U. S., and has played a leading role in lighting more than 100 million sq. ft. of war production factory areas. He has figured prominently in the design of such outstanding lighting installations as prevail today in Curtiss-Wright, Consolidated, Douglas, Pratt & Whitney, and General Motors aircraft plants. One of these projects involved the lighting of a mile-long windowless war plant where Taylor's fluorescent lighting recommendations today are a distinct feature of that advanced structure.

• **Dean M. Warren**, in charge of technical publicity at General Electric's Nela Park, Cleveland, has been transferred to Empire Division of the firm's lamp department at Buffalo. Mr. Warren will devote full time to wartime lighting of industries in the Buffalo area.

• **M. Elizabeth Geve** has been appointed personnel manager for the Giddings & Lewis Machine Tool Co., Fond du Lac, Wis. She succeeds **Fred C. Freund**, who has been called to army duty. For 15 years Miss Geve was coordinator of the Fond du Lac vocational school and had served as personnel consultant for Giddings & Lewis for many years.

• **Gordon L. Leach** has been appointed assistant to president of the Hunt-Spiller Mfg. Corp. He was employed in the mechanical department of the Boston Elevated Railway, and became associated with Hunt-Spiller Mfg. Corp. in 1930 as representative in their sales department.

OBITUARY...

• **Charles B. Harris**, credit manager and assistant secretary of the J. H. Williams & Co., manufacturers of drop-forgings and drop-forged tools, died suddenly at the company offices on Nov. 25. Death came as a result of a heart attack. He was 61 years old. Mr. Harris would have completed 37 years of service next January.

• **Jerome R. George**, designer and constructor of steel mills throughout this country and in England, France, Belgium and India, a former vice-president and chief engineer of the Morgan Construction Co., Worcester, Mass., and president and chairman of the board of Aetna-Standard Engineering Co., Youngstown, Ohio, died Nov. 30, in Beverly Hills, Cal. In 1907 he designed and built the first continuous sheet bar mill, installing it at Youngstown Sheet & Tube Co.'s Campbell plant. Just before his retirement from the Worcester company he supervised the design and construction of the Ford River Rouge plant. Mr. George was 75 years old.

• **Horace M. Houser**, formerly president of the Akron Cultivator Co., died Nov. 30 at his home in Boston, aged 81 years. He had retired from business 20 years ago.

• **William R. Kales**, structural steel engineer and president of Whitehead & Kales Co., Detroit, died of a heart attack recently. A graduate of Massachusetts Institute of Technology, Mr. Kales went to Detroit in 1899, entering business with James T. Whitehead. His firm handled steel work for the Willow Run bomber plant and two midwest plants of Wright Aeronautical Co. in past months, among others.

• **George C. Wilson**, 42, manager of the Middletown sales district of the American Rolling Mill Co., died last week in Middletown from a heart ailment, aged 42 years. Mr. Wilson served as district sales manager in the Cincinnati office of Armco until 1932, when he transferred his headquarters to Middletown.

• **James D. Kehr**, manager of the metal spinning department of the Phoenix Products Co., Milwaukee, died suddenly from a heart attack, aged 46 years.

MACHINE TOOLS

... Sales, Inquiries and Market News

Machine Tool Order Backlogs To Be Evened Up

Washington

• • • **George H. Johnson**, new director of the WPB Tools Division, announced last Saturday that he would inaugurate a policy of relocating backlogs of machine tool orders to speed the production of machine tools for aircraft manufacture. The policy has also been advocated by the Army and Navy Munitions Board for some time. Studies have been started with a view to determine what orders can be relocated with a minimum of disruption of the industry's financial structure. Relocation's which would impose undue hardship will not be undertaken or will be accomplished as painlessly as possible.

Mr. Johnson said that machine tool production had reached a rate of approximately \$130,000,000 worth monthly, but that some manufacturers had orders covering two years or more production while others only had orders for a few weeks. The purpose of rearrangement of schedules will be to keep the backlogs as nearly even as possible.

"Averaging out order boards will mean delivery of critical tools in less time," Mr. Johnson said. "If we have ten companies capable of making a certain type of tool, we don't want five of them to have most of the orders. We cannot afford to have any idle or retarded capacity among companies able to produce tools we badly need. We want each firm to carry as much of the load as it can—and spreading the orders will make this possible."

The desirability of this policy was advocated by Ferdinand Eberstadt, WPB Program vice-chairman, when he accepted his WPB job, one WPB spokesman said. Mr. Eberstadt, it is said, regarded this move as one of the first things to be accomplished, and remains convinced that this is the only way to get needed machine tools when wanted, and not eighteen months in the future.

WPB officials say that order relocation is not a tacit criticism of

past Army and Navy procurement policies. It is claimed that backlogs originated naturally because of the fact that manufacturers have insisted on purchasing tools from customary suppliers with particular brand names. The redistribution of orders, it is insisted, will not result in the production of tools of inferior quality.

Renegotiation Under Way

Cincinnati

• • • **Renegotiation** of war contracts became an actuality in the district machine tool market in the past two weeks when local Price Adjustment Boards contacted virtually all machine tool men in the area. Following the preliminary contact, a meeting was called of all the Cincinnati builders at which time price and adjustment officials attempted to give a detailed explanation of their procedure. While lacking in specific details, it appears that they are observing the April 28, 1942, deadline and are not renegotiating any contracts on which delivery and payment has been made prior to that date.

In addition they are holding to the legal provision that only contracts with the Army, Navy, Maritime Commission and Treasury Department are to be renegotiated, except for certain types of contracts under the DPC pool order setup in which shipment was made to a person having war contracts. Machine tool builders will now have to satisfy government officials by making a complete analysis of all their sales and deliveries for the fiscal year, to ascertain whether or not renegotiation is necessary.

Cancellations of orders continue to come in, although some machine tool builders indicate that some contracts canceled have been restored to their books and they indicate some uncertainty among purchasers as to the propriety of earlier cancellations. In addition to these renewals, other business flows into the market, but not at the wild pace of several months ago.

Data on Final Disposition Of Tools Sought by Builders

Cleveland

• • • **Machine tool builders** recently sent out to their dealers and customers letters requesting the final disposition of tools that were delivered during the past year. Buyers have been requested to specify their total purchases of tools and to which government agency the tools were allocated originally. This will permit the builders to have complete information on the disposition of their products when they go before the various Price Adjustment Boards for renegotiations of contracts.

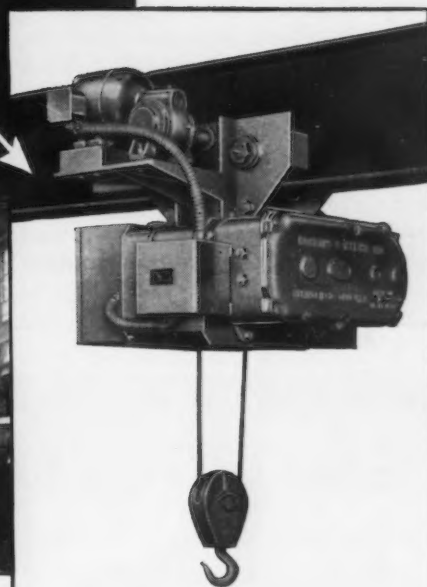
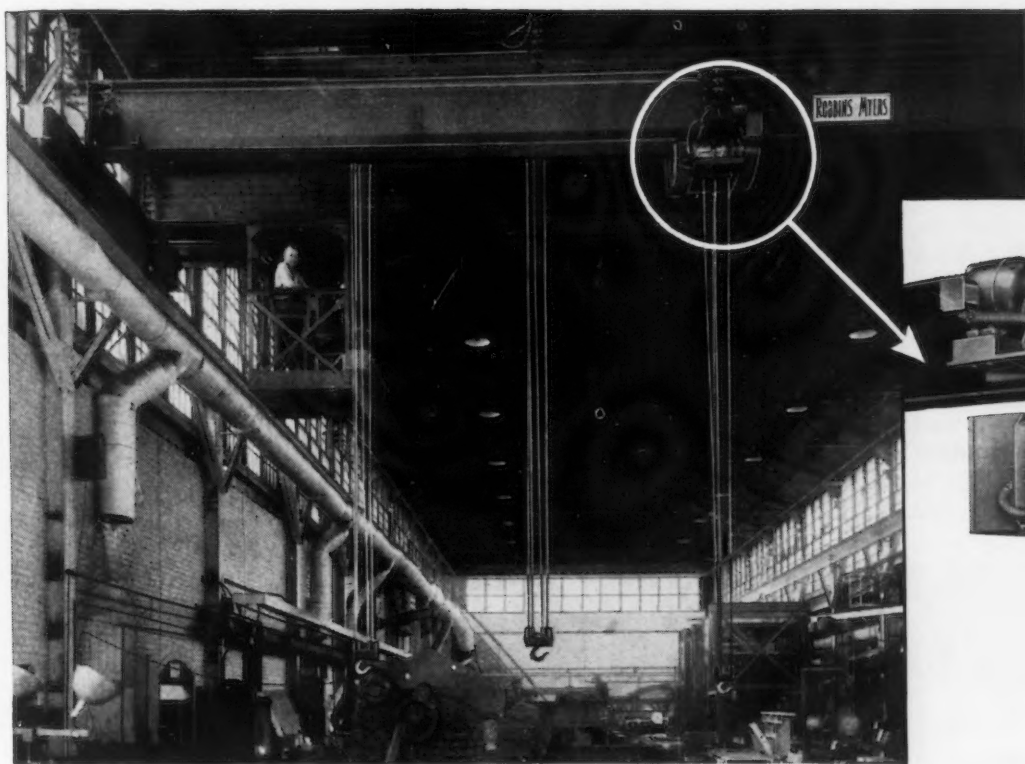
This week officials of the National Acme Co. reported that the new DPC plant which had been built for the manufacture of machinery to make .30 and .50 caliber bullet cores would be used in part for manufacturing and assembling hydraulic brakes and wheels for airplanes, a regular line. This phase of the business has expanded to such an extent that it is believed as much as two-thirds of the new plant as well as the floor space now in use in the old plant would be required to meet contracts.

The Vanderhorst Co., formerly of Olean, N. Y., recently acquired the plant site of the former Lakewood Engineering Co., and is expected to be in full operation by Feb. 15. This company will engage in chrome plating diesel engine cylinders. A porous plating of the cylinders will be achieved by special plating techniques, the processing being done on products of a diesel engine manufacturer in this area.

New NE Steel Booklet Published by Ryerson

• • • **A new booklet** on NE (National Emergency) Steels has just been published by Joseph T. Ryerson & Son, Inc. It deals with the selection and heat treating of NE Steels and is readily understandable and explains the subject of NE Steels minus the confusion of curves, graphs and technical wordage. Copies are available on request.

Double your Crane Speed on **LIGHT LOADS** with an auxiliary R & M Hoist!



Do you have cranes that were installed to handle heavy loads, but are now forced to handle *light* loads, too? If so, you no doubt realize that the slow speeds of these "Goliaths"—on jobs that should be done by *fast, low-capacity* hoists—can seriously hold up production.

Here's a practical answer to this problem. If the crane bridge is of double I-beam construction, you already have the track for a high-speed *auxiliary* R & M Hoist that may be easily installed and controlled from the cab. In the average plant it will handle up to 70% of the lifts made by the crane, and at *twice the speed*—which should result in a substantial increase in production.

Let us help you! Write us, stating the make and capacity of your I-beam cranes. We'll be glad to analyze your need and recommend the right auxiliary R & M Hoist to fit your equipment.

The R & M Motor-Driven Trolley Hoist (in action at left) is ideal for auxiliary installations as well as for standard hoisting jobs. It is precision-built of steel, compactly designed for low head-room and higher lifts. Available in 1000-lb. and 2000-lb. capacities. Other R & M Hoists, up to 15,000 lbs. in capacity, offer the same outstanding advantages for heavier lifting applications.

R & M HOIST AND CRANE SALES AND SERVICE OFFICES

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Atlanta.....319 Walton Bldg.
Baltimore, Lombard & Concord St.
Boston.....74 Needham St.
Chicago.....2400 W. Madison St.
Cincinnati.....418 New St.
Cleveland.....470 Rockefeller Bldg.

Denver.....1420 16th St.
Detroit.....2921 E. Grand Blvd.
Houston.....3715 Harrisburg Blvd.
Jacksonville.....305 Bisbee Bldg.
Montreal.....Lyman Tube &
Supply Co., Ltd.
Newark.....700 Bergen St.

New York.....200 Varick St.
Philadelphia.....401 N. Broad St.
Pittsburgh.....H. W. Oliver Bldg.
Providence.....44 Clifford St.
San Francisco, 116 New Mtgmy. St.
Seattle.....216 Walker Bldg.
Syracuse.....204 State Tower Bldg.

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NON-FERROUS METALS

... Market Activities and Price Trends

Can Collecting by Cap Makers Attacked

• • • This week's tempest concerns bottle tops for brewers. According to the *Washington Times-Herald*, the Senate's Truman Committee, investigating the war program, has testimony claiming that a faction of WPB officials has been more interested in helping brewers and bottlers get tin than in reclaiming the metal for war purposes. According to the *Times-Herald*, data submitted to the committee indicates that the tin "scrap drive is breaking down just as the aluminum, paper and rubber salvage campaigns have collapsed."

Brewers, it is reported, have bid for cans from the Army, Navy and other federal agencies. It was charged to the Senate Committee

that in some cases they have forced restaurants and hotels to contribute cans if they are to get bottled goods.

It is true that detinning plants are receiving much less can scrap than they are able to treat. The No. 10 and larger cans which are allowed crown cap manufacturers under WPB order M-72-a however, do not come to more than 20 per cent of the total can production, and at least half of this goes from the cap makers to the detinners' as residual scrap.

Apparently, the only efficient collecting of old cans has been done by the cap makers. It is estimated by *American Metal Market* that civic collections would total about 45,000 tons a month, if the efficiency of the cap makers were duplicated. Total civic collections for this year amount to about 45,000 tons.

Alcoa Forging Output Now 25 Times 1938's

• • • Forging plants of the Aluminum Co. of America now take the output of several aluminum plants, George J. Stanley, vice-president and general sales manager of the company, has announced. Production of forgings is now at a rate 25 times that of 1938, he said. In the same period of time, aluminum production has increased about fivefold. In 1939, Mr. Stanley said, forgings represented only about 1½ per cent of new aluminum production.

As many as 150 different types of aluminum forgings are used in a single fighter plane, while bombers may have as many as 300 different types.

McCarran Offers New Silver Use Proposal

• • • Enlivened slightly by blood and thunder, consideration of a war measure for silver still putters along in Congress. Last week Senator Pat McCarran of Nevada, who recently claimed threats of violence were being aimed at him for his part in the silver program, offered a revision to the Green bill, the measure which is now under consideration. Under McCarran's suggested provision, unpledged silver would be released for consumptive use at a price of 71.11c. an oz., the same price which the Treasury pays. At present, the Treasury can sell unpledged silver for not less than \$1.29 an oz. Under the Green bill, silver would be sold at 50c. an oz.

The Treasury is lending a limited amount of unpledged silver to industry for non-consumptive purposes, and under the Green bill this silver, which would be returned after the war, would be considered pledged silver. Thus silver which is at present pledged and holed up in West Point would be freed.

Dr. Walter Spahr, economist who has been one of the leaders in the fight against the Silver Purchase Act, did the cause a disservice recently when he argued that such a switch of pledged and unpledged silver is not feasible because silver

MOORE RAPID Lectromelt FURNACES



TOP
← CHARGE
TYPE

Illustrated is a recent installation of 10 ton capacity, top charge type, Lectromelt furnace in pouring position. This is the second Lectromelt installed in the same plant, and a third is now being built. These and many others are now producing essential alloy steel 24 hours per day, 7 days a week.

★ Use of top charge type LECTROMELTS result in greater production, lower power consumption, lower electrode and refractory costs, and increased tonnage per man hour. They are built in standard sizes ranging from 100 tons down to 250 lbs. Write for information on LECTROMELTS to meet your melting requirements.

PITTSBURGH LECTROMELT FURNACE CORPORATION
PITTSBURGH, PENNSYLVANIA

certificates could not then be redeemed in bullion. His solution was to withdraw the silver certificates and substitute Federal Reserve notes. Demonetization of silver has been the great fear of the silver bloc, which has claimed that this is the ulterior purpose of silver-for-war-production proponents. Industry, which really badly needs silver, is caught in the middle.

The House Coinage Committee is to meet next session of Congress to review the whole question of the Treasury silver purchase program, its chairman, Representative Somers, announced last week.

WPB to Promote X-Ray Tests of Die-Castings

• • • The die-casting industry advisory committee, has approved a plan by which names of WPB-inspected producers who supply special quality, X-ray tested, zinc and aluminum die-castings for use in producing ammunition and other combat items, will be certified to the Army and Navy. The plan was announced by Harvey Anderson, government presiding officer of the committee.

The die-casters approved a specification calling for X-ray examination of the entire run of sample aluminum castings and of a specified number of random samples taken from the production run.

The inspection of qualified producers is to be in the hands of a three-man committee nominated by the technical subcommittee of the advisory committee.

Production of zinc base and aluminum base die castings is now about three times as great as during peace time. All present production is on war orders, of course. The 48 producers of machine die castings employ nearly 6000 workers. Output increase has been principally through added shifts rather than plant expansion.

Steel Cored Wire Saves Large Copper Tonnage

• • • Through the use of wire, rods and strand made of copper welded over a heavy steel core instead of 100 per cent copper, more than 5,000 tons of copper were saved during the first nine months of this year, Copperweld Steel Co., Glassport, Pa., estimates. Power companies, communications com-

12% of Copper, 16% Of Zinc Sent Abroad

• • • One-eighth of our total new supply of copper and one-sixth of our total new supply of zinc were sent abroad to the United Nations during the first half of 1942, President Roosevelt has announced. This includes both Lend-Lease and direct purchase shipments.

panies, railroads and the Army and Navy made most of the savings, using the steel cored wire for transmission and distribution conductors, radio communications telephone line and drop wire, etc.

Copperweld reports that sales of its bimetallic wire products for uses where solid copper ordinarily would be used totaled more than 7500 tons during the nine months. Percentage of copper saved ranges from 60 to 70 per cent. The company estimates that 15,000 tons of copper will be similarly saved, or rather stretched, in 1943.

Smelters Extract Indium

• • • Zinc smelters are reported now extracting indium in commercial quantities. The quantities do not have to be very large to be commercial; they are under 20 tons at present. The metal is valued at \$12.50 a troy oz.

The quantity produced is increasing as uses grow. Its first commercial use was for dental alloys, but lately it has been used in bearings of lead, cadmium, silver or copper, particularly as a tin saver. It is also used, among other things, in brazing and soldering alloys.

Non-Ferrous Prices

(Cents per lb. for early delivery)

Copper Electrolytic ¹	12.00
Copper, Lake	12.00
Tin, Straits, New York	52.00
Zinc, East St. Louis ²	8.25
Lead St. Louis ³	6.35

¹ Mine producers' quotations only, delivered Conn. Valley. Deduct ¼c. for approximate New York delivery price. ² Add 0.42c. for New York delivery. ³ Add 0.15c. for New York delivery.

Zinc Price Change

The New York delivered price for zinc, given in footnote 2 above, has been raised 0.02c. per lb., reflecting the new 3 per cent freight tax. Therefore a New York zinc price of 8.67c. per lb. became effective Dec. 1, 1942.



A shot or grit that will blast fast with a clean finish.

This is the only reason why so many operators are daily changing to our shot and grit, from Maine to California.

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HEAT-TREATED STEEL GRIT

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**Heat-Treated Steel Shot and
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has enabled us to expand our production and maintain a quality that is more than satisfactory to our hundreds of customers all over the country.



SCRAP

... Market Activities and Quotation Trends

Cold Weather Hits Movement of Scrap

• • • With some sections of the nation gripped by severe winter weather late last week, the movement of scrap was slower, forcing some mills to draw upon their stockpiles.

Meanwhile, dealers and con-

Stockpiles under government supervision are planned for the Pacific Coast area, says West Coast column, page 80.

sumers continued hard hit by the labor shortage, which for months has been their No. 1 problem. Philadelphia reported early this week that scrap dealers puzzled over last week's stop-shipment orders learned from mill buyers that lack of labor and equipment in mill yards had contributed to the situation. Lack of equipment to handle light scrap in volume

and lack of storage space were other reasons.

Yard operators are unable to hold employees any great length of time, due to the attractive pay offered in war plants. The scrap industry, under OPA ceiling prices, cannot meet the labor rates being paid elsewhere. Crane operators and truck drivers in particular are hard to hold.

A complaint was reported filed last week by the OPA against Carnegie-Illinois Steel Corp. in a Chicago court charging violations of the scrap price order. It was reported that the charges, while not specifically announced, included payment of above-ceiling prices, use of electric furnace scrap in open hearths and failure to keep adequate records. Corporation spokesmen asserted every effort had been made to adhere to OPA regulations.

Industry Scrap Drive Reaches Billion Pounds

Philadelphia

• • • At least a billion pounds of scrap have been collected from some 568 plants in this area since June, was announced this week by A. Merritt Simpson, regional director of WPB's Industrial Salvage Section. Philadelphia itself was credited with over 777-million lb. not including 200-million lb. which was contributed by the general public.

While many plants could contribute only small amounts, some of the larger industries gave millions of pounds. Typical are these figures drawn from WPB reports which show as examples: Pennsylvania Railroad with 551,911,300 lb.; Sun Shipbuilding 109,148,269 lb., and Atlantic Refining with 23,638,841 lb. Copper, brass and other scarce non-ferrous metals were included in the reports of the Philco Corp. who contributed 7,560,166 lb. and Westinghouse with 6,749,125 lb. Not the entire total from some of these companies can be credited to the Philadelphia area alone.

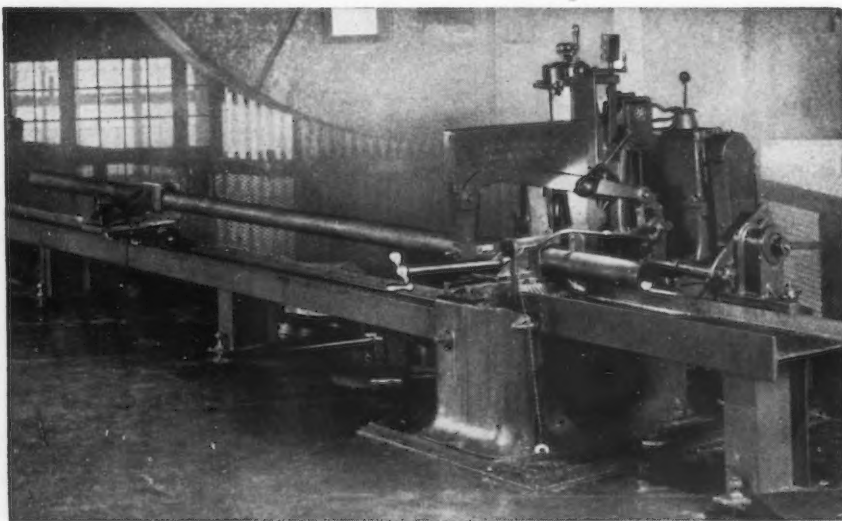
County contributions showed 139-million for Delaware County, 54-million for Montgomery County and over 3-million for Bucks County since August.

Jalopie Reserve Called Lowest for this Year

Philadelphia

• • • The reserve of jalopies held in automobile graveyards here was said to be the lowest at any time this year by George McLaughlin, district director of the WPB Scrap Processors Section.

Yards here report 14,189 junk cars on hand still to be processed which is at least a third lower than the usual reserve this year. Processed tonnage, too, has fallen somewhat for November from the July high of 15,500 tons to 11,714 tons. Since April the 600 automobile graveyards in Pennsylvania report processing of slightly over 120,000 junked cars.



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The most economical method of cutting-off identical pieces from bar steel is with a MARVEL Automatic Production Saw. It will give you more pieces per hour, per machine and per dollar cost than any other accurate cutting-off method. Figured in cost per piece, it will have the lowest labor cost too, because MARVEL Automatic Saws operate with no more attention than an automatic screw machine. They keep chip loss down to a minimum and on many jobs will give you extra pieces per bar.

For cast automatic production or for single-cut miscellaneous work, MARVEL 6A or 9A Hack Saws are fast, accurate tools. Capacities 6" x 6" or 10" x 10", single or nested bars. Write today for Bulletin N. 600.



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District Markets

BIRMINGHAM—A surplus of scrap in both steel and cast grades is now reported in the Southern district but how long this situation will continue is problematical. Southern dealers are still faced with the problem of disposing of large amounts of light material which was accumulated in yards during the salvage campaign and which is not acceptable to mills.

BOSTON—Removal of approximately 9000 tons of unused trolley rails in Springfield, Mass., has started. There is a potential tonnage of such rails for which government agents have completed negotiations hanging over the market, but just when removal will start is problematical. The abandonment of the WPA has complicated the scrap situation somewhat. Latest figures available show some 800,000 tons of scrap metal (prepared) have been contributed by New England during the past six months.

BUFFALO—Scrap shipments destined for Buffalo are being diverted under allocations to Youngstown, Ohio, where they are more urgently needed, yard operators report. Also some allocations of special scrap in Buffalo yards have been made to foundries, some outside the city. Local receipts remain slow due to weather and manpower. Proprietors have been heartened by the Buffalo War Manpower Committee's announced determination to recruit 40,000 women to release men for heavy work. They hope this eventually will divert taxi drivers to the yards where trucks are idle.

NEW YORK—Both collections and shipments to mills have slowed down. Hardly any scrap is coming through except a little salvage material, and dealers expect eastern mills to begin eating into the surpluses they have piled up. Rejections seem to be back to normal. Few new allocations have come in, though dealers are still filling those issued several weeks ago.

CLEVELAND—Despite cold weather and snow in this area, scrap movement to the mills has not abated. This can be traced, however, to the scrap that is moving out of the scrap yards into the mills rather than to new scrap moving into the yards. Much of the scrap from drives in the various Ohio areas is only now moving out of the yards after the necessary sorting, processing, and handling. Considerable scrap is being allocated to mills in the Valleys and in Cleveland, some from the Buffalo area and some from the South and Southwest.

PHILADELPHIA—The embargo placed by some mills here has been relaxed this week with shipment scheduling taking its place. Consequent to limited shipment, movement from the yards has been lower for the past two weeks although dealers report that outgoing shipments are exceeding inflow in bulk. Yard stocks are becoming leaner and collections have fallen off to a noticeable degree. Scrap from city collections will probably be exhausted within the next two to three

BREAKDOWN OF SCRAP STOCKS IN HANDS OF CONSUMERS, SUPPLIERS AND PRODUCERS

(In gross tons as of last day of each month)

(000 omitted)

From Bureau of Mines Reports

	Consumers			Suppliers and Producers	Total Stocks		
	Stocks of Prepared and Un-prepared Purchased Scrap	Stocks of Home Scrap	Total Scrap	Total Stocks	Purchased Scrap	Home Scrap	Total Scrap
January...	2,074	1,007	3,082	973	3,047	1,007	4,054
February...	1,989	1,020	3,009	988	2,977	1,020	3,997
March...	2,045	971	3,015	1,011	3,056	971	4,027
April...	2,213	950	3,163	1,036	3,249	950	4,199
May...	2,499	930	3,429	1,055	3,554	930	4,484
June...	2,758	1,050	3,808	1,022	3,780	1,050	4,830
July...	2,916	1,139	4,056	999	3,915	1,139	5,054
August...	3,052	1,186	4,237	1,011	4,063	1,186	5,249
September...	3,199	1,231	4,431	1,087	4,286	1,231	5,517

weeks but quantities are reported in collected piles in outlying districts still to be hauled into yards. An actual scrap shortage is not foreseen in these facts but a less comfortable condition by February is almost a certainty.

PITTSBURGH—Near zero weather here last week and early this week was

affecting scrap collections and preparations to some extent but so far no serious situations have arisen. Some yards had material on hand which they were processing. However, the bitter cold weather which, fortunately, was not accompanied by heavy snow, brought home the need for heavy scrap inventories at steel plants in order to maintain maximum steel production.

RUTHMAN



Ruthman Gusher Coolant Pumps are most efficiently designed. This is why today Ruthman pumps are so dependable and stand up under the most grueling usage. Many well known machine tool manufacturers know this and for this reason use Ruthman on their machines thereby making a good machine even better.

The **RUTHMAN**
MACHINERY COMPANY
CINCINNATI, OHIO



Coolant PUMPS

SCRAP PRICES

IRON AND STEEL (OTHER THAN RAILROAD) SCRAP

ELECTRIC FURNACE, ACID OPEN HEARTH AND FOUNDRY GRADES

(All Prices Are Per Gross Ton)																				
BASIC OPEN HEARTH GRADES				BLAST FURNACE GRADES				Low Phos.			Heavy Structural and Plate			Cut Auto Steel Scrap						
(No. 1 Heavy Melting; No. 1 Hydr. Compressed Black Sheets, No. 2 Heavy Melting; Dealers' No. 1 Bundles; No. 1 Busheling)				(Mixed Borings and Turnings; Shovelling Turnings; No. 2 Busheling; Cast Iron Borings)				Bar Crops, Punchings Plate Scrap and Cast Steel						1 ft. and Under Auto. Springs, and Crank-shafts						
Unbaled* Machine Shop Turnings				No. 2 Busheling				Billet, Bloom, Forge Crops			3 ft. and Under			2 ft. and Under			1 ft. and Under			
Pittsburgh, Brackenridge, Butler, Monessen, Midland, Johnstown, Sharon, Canton, Steubenville, Warren, Youngstown, Weirton, Cleveland, Middletown, Cincinnati, Portsmouth, Chicago, Claymont, Coatesville, Conshohocken, Harrisburg, Phoenixville, Sparrows Pt., Ashland, Ky., Buffalo, N. Y., Bethlehem, Pa.; Kokomo, Ind., Duluth, Minn., Detroit, Mich., Toledo, Ohio, St. Louis, Mo., Atlanta, Ga.; Alabama City, Ala.; Birmingham, Los Angeles; MPittsburgh, Cal.; San Francisco Innequa, Cole, Seattle, Wash.				\$20.00	\$16.00	\$16.00	\$17.50	\$25.00	\$22.50	\$21.00	\$21.50	\$22.00	\$20.00	\$20.50	\$21.00	\$18.00	\$19.50	\$21.00		
				19.50	15.50	15.50	17.00	24.50	22.00	20.50	21.00	21.50	19.50	20.00	20.50	17.50	19.00	20.50		
				18.75	14.75	14.75	16.25	23.75	21.25	19.75	20.25	20.75	18.75	19.25	19.75	16.75	18.25	19.75		
				19.50	15.50	15.50	17.00	24.50	22.00	20.50	21.00	21.50	19.50	20.00	20.50	17.50	19.00	20.50		
				19.25	15.25	15.25	16.75	24.25	21.75	20.25	20.75	21.25	19.25	19.75	20.25	17.25	18.75	20.25		
				18.25	14.25	14.25	15.75	23.25	20.75	19.25	19.75	20.25	18.25	18.75	19.25	16.25	17.75	19.25		
				18.00	14.00	14.00	15.50	23.00	20.50	19.00	19.50	20.00	18.00	18.50	19.00	16.00	17.50	19.00		
				17.85	13.85	13.85	15.35	22.85	20.35	18.85	19.35	19.85	17.85	18.35	18.85	15.85	17.35	18.85		
					13.85	13.85	15.35													
				17.50	13.50	13.50	15.00	22.50	20.00	18.50	19.00	19.50	17.50	18.00	18.50	15.50	17.00	18.50		
				17.00	13.00	13.00	14.50	22.00	19.50	18.00	18.50	19.00	17.00	17.50	18.00	15.00	16.50	18.00		
				16.50	12.50	12.50	14.00	21.50	19.00	17.50	18.00	18.50	16.50	17.00	17.50	14.50	16.00	17.50		
				14.50	10.50	10.50	12.00	19.50	17.00	15.50	16.00	16.50	14.50	15.00	15.00	12.50	14.00	15.50		

The Iron Age Critical Tool Locating Chart

Compiled from latest WPB data on available machine tool capacity.

CRITICAL TOOLS	REGIONAL OFFICES—WAR PRODUCTION BOARD											
	Total	No. 1 Boston	No. 2 New York	No. 3 Phila- delphia	No. 4 Atlanta	No. 5 Cleveland	No. 6 Chicago	No. 7 Kansas City	No. 8 Dallas	No. 10 San Francisco	No. 11 Detroit	No. 12 Minne- apolis
BORING												
Horizontal—3" Bar	51,225	7,235	8,571	5,960		10,464	8,461	1,256	1,689	3,231	5,616	742
" —To 4" Bar and Over	67,128	5,958	8,443	10,048		22,880	8,288	3,773	1,830	5,362	3,672	1,176
Vertical—54"	40,761	4,182	6,462	5,204		8,861	5,054	4,410	1,333	912	2,060	2,283
" —To 84"	56,436	4,166	6,232	9,075		14,271	5,047	4,335	3,588	5,917	2,181	1,844
" —To 120"	17,886	1,732	2,376	1,997		5,482	1,845	1,481	372	1,099	1,042	460
" —Over 120"	5,260		668	1,428		1,649	684	346	37	180	120	168
Jig Bore	32,787	7,516	5,907	2,892		5,155	3,994	789	158	2,377	3,740	259
Misc. Precision—Heald—Ex-Cell-O type	22,622	1,711	1,079	1,210		7,792	4,202	1,561	120	2,765	1,954	228
BROACHING	83,955	16,046	10,729	5,960		17,403	13,931	2,209	934	4,793	10,491	1,933
DRILLING												
Radial 6' to 8' Radius	74,333	6,944	8,106	10,943		23,225	8,221	5,173	3,608	2,321	4,268	1,526
Over 8' Radius	4,736	162	394	1,186		370	96	456	1,876	64	72	60
DUPLICATING AND PROFILING	34,636	13,191	7,895	3,169		4,048	2,945	383		1,626	1,241	138
FORGING												
Drop—Hammer—Board 100 lb. up	134,400	40,363	34,394	10,128		21,964	9,865	938	762	1,636	13,350	1,000
Steam 5000 lb. up	14,624	2,480	1,135	1,298		4,563	903		170	172	2,835	1,068
Press—Forging—Steam Hydr. 500 ton	8,041	1,204	1,826	48		2,689	1,850	216		92	336	
GEAR CUTTING												
Gear Hobbers—48" and up	25,782	2,742	1,509	3,192		7,385	2,942	1,900	733	1,454	3,451	474
Bevel Gear Cutters	54,489	11,876	4,948	7,214		14,175	6,943	1,858	720	2,199	3,952	604
GRINDERS												
Centerless	37,045	8,748	3,421	3,236		6,603	5,797	1,514	72	1,729	5,817	108
External Cyl.	445,490	109,276	72,405	39,003		63,785	50,046	24,854	4,473	24,425	41,775	15,448
Internal Cyl.	155,251	30,423	10,931	13,256		22,296	20,465	12,314	4,625	13,415	16,322	5,204
Thread	4,954	1,262	363	729		752	184		168	775	700	
LATHES												
Engine—24" Dia.—Over 60" c.-c.	235,577	33,559	36,681	30,345		48,562	24,260	14,871	14,758	14,892	8,695	8,954
" —Over 24" Dia.—To 60" c.-c.	87,325	14,175	16,262	9,727		15,458	10,696	8,807	1,956	4,218	3,412	2,614
" —Over 24" Dia.—To 96" c.-c.	149,834	19,616	23,354	15,247		32,184	13,542	16,249	8,120	11,352	6,871	3,299
" —Over 24" Dia.—Over 96" c.-c.	376,777	52,449	46,490	55,561		74,944	28,149	33,211	27,674	36,378	14,308	7,613
Turret—12" Dia. 2 1/2" Bar and up	105,000	16,207	24,256	12,908		20,251	11,069	4,724	1,403	2,275	9,611	2,296
" —To 24" Dia. 2 1/2" Bar and up	191,813	24,048	26,353	22,739		39,923	18,972	14,310	7,686	18,220	12,857	6,405
" —Over 24" Dia. 2 1/2" Bar and up	44,521	3,737	5,005	6,482		9,040	6,142	3,877	2,520	5,249	1,395	1,074
Automatic—12" Diameter	17,087	2,509	2,084	664		851	6,916	1,138		276	2,540	109
" —To 24" Diameter	18,531	2,673	2,058	336		1,731	1,541	402		4,593	4,136	1,061
" —Over 24" Diameter	2,237		498	48		168	1,473			50		
SCREW MACHINES												
Automatic—Single 1"	73,926	17,096	22,454	7,613		10,828	9,094	1,879	124	550	3,684	604
" —Single to 3"	80,350	17,313	10,498	9,392		16,566	14,242	3,446		4,388	4,185	120
" —Single—Over 3"	19,174	3,329	2,036	2,192		2,770	7,043			753	973	76
" —Multiple—To 3/4"	6,888	684	617	600		592	312				3,883	
" —Multiple—To 1"	104,174	20,608	15,432	10,942		17,830	18,487	3,141		2,848	14,303	804
" —Multiple—To 3"	77,255	11,817	8,898	10,203		16,766	13,444	4,308		3,046	7,734	1,039
" —Multiple—Over 3"	3,511	1,029		116		996	458				644	268
MILLING												
Standard Type—Horizontal—No. 3	244,413	44,008	41,201	21,687		45,175	29,381	14,705	7,248	14,810	19,416	6,782
" —Horizontal—Over No. 3	123,073	15,433	18,739	18,413		26,112	10,081	7,064	3,736	11,193	9,569	2,796
" —Vertical—No. 3	49,929	14,149	7,250	3,408		8,685	5,307	1,418	316	2,337	6,682	397
" —Vertical—Over No. 3	50,121	14,170	4,045	6,878		9,696	4,793	1,213	378	2,217	5,896	835
Mfg.—Horizontal—12" table width	33,734	11,154	6,984	1,270		4,079	5,322	1,112	120	1,100	1,823	770
" —Horizontal—Over 12" table width	20,891	2,710	2,083	969		5,478	5,233	756		1,278	1,963	421
Planer—Over 30" table width—slab mill	8,587	2,176	1,557	726		2,346	402	496			272	612
" —Over 30" table width—side spindle	2,745	360	158	909		185	231	144		128	366	264
" —Over 30" table width—vert. spindle	7,132	1,816	1,517	1,004		1,167	392		158		464	614
" —Over 30" table width—side and vert.	10,921	2,290	1,184	947		3,399	1,721	192		292	695	201
Misc. and Dia. Cutting—Heller Type	21,092	6,605	5,303	1,410		4,470	1,292	316		954	742	
PLANERS												
60" wide to 15'	13,079	1,276	1,609	2,169		3,037	1,796	1,094	804	476	734	84
60" wide, over 15'	5,590	720	579	880		871	767	694	184	437	380	168
Over 60" wide to 15'	3,494	408	515	1,054		678	188	202	37	96	144	192
Over 60" wide, over 15'	9,039	783	1,392	1,496		4,136	304	258		162	180	328
THREADERS												
External Mills	32,270	7,043	3,536	3,260		4,494	3,097	952	928	3,913	3,784	1,263
Internal Mills	3,088	162	41	417		902	1,182	216	168			
TOTAL AVAILABLE HOURS	3,604,519	643,550	542,283	398,711		699,842	414,969	210,871	105,712	225,063	276,950	88,588

The available critical tool hours per week here shown are based on a 168-hour week and represent usable tool hours subject to operating labor available. Reports are based on initial inspection of the plants concerned by engineers trained for this work. The War Production Board Field Offices are acting as clearing houses for all public or private contractors or agencies interested in using these facilities. These records are revised and reissued weekly.

When making inquiries regarding the availability of these critical tool hours for specific jobs, communicate in detail with the Regional Supervisor, Critical Tools Service, in the WPB Region best located for your job. They are:

Region	Supervisor	Assistant	WPB Office
No. 1 Boston	Deane Freeman	H. C. Woodsum	17 Court Street
No. 2 New York	P. J. Lahny	C. Philippi	122 E. 42nd Street
No. 3 Philadelphia	C. E. Reinicker	R. V. Hillands	1617 Penn. Blvd.
No. 5 Cleveland	C. J. Perrier	C. R. Griffith	Union Commerce Bldg.
No. 6 Chicago	S. C. Bloom	W. I. Buhl	20 N. Wacker Drive
No. 7 Kansas City	W. A. Crooks	M. L. Blessing	Mutual Interstate Bldg.
No. 8 Dallas	W. E. White		4th Fl. Fidelity Bldg.
No. 10 San Francisco	M. Brookman	S. W. Liftchild	1355 Market Street
No. 11 Detroit	R. O. Cunningham	J. B. Shepard	7310 Woodward Avenue
No. 12 Minneapolis	E. H. Pitney		334 Midland Bk. Bldg.

The more specifically a need is defined as to hours required, tolerances and deliveries, the more accurately can WPB Field Staff report to you on availability and fitness of facilities wanted.

Composite Prices . . .

Advances Over Past Week in **Heavy Type**; Declines in *Italics*.

[Prices Are F.O.B. Major Basing Points]

Flat Rolled Steel: (Cents Per Lb.)	Dec. 14, 1942	Dec. 8, 1942	Nov. 17, 1942	Dec. 15, 1941
Hot rolled sheets	2.10	2.10	2.10	2.10
Cold rolled sheets	3.05	3.05	3.05	3.05
Galvanized sheets (24 ga.)	3.50	3.50	3.50	3.50
Hot rolled strip	2.10	2.10	2.10	2.10
Cold rolled strip	2.80	2.80	2.80	2.80
Plates	2.10	2.10	2.10	2.10
Plates, wrought iron	3.80	3.80	3.80	3.80
Stain's c.r. strip (No. 302)	28.00	28.00	28.00	28.00

Tin and Terne Plate: (Dollars Per Base Box)	Dec. 14, 1942	Dec. 8, 1942	Nov. 17, 1942	Dec. 15, 1941
Tin plate, standard cokes	\$5.00	\$5.00	\$5.00	\$5.00
Tin plate, electrolytic	4.50	4.50	4.50	4.50
Special coated mfg. ternes	4.30	4.30	4.30	4.30

Bars and Shapes: (Cents Per Lb.)	Dec. 14, 1942	Dec. 8, 1942	Nov. 17, 1942	Dec. 15, 1941
Merchant bars	2.15	2.15	2.15	2.15
Cold finished bars	2.65	2.65	2.65	2.65
Alloy bars	2.70	2.70	2.70	2.70
Structural shapes	2.10	2.10	2.10	2.10
Stainless bars (No. 302)	24.00	24.00	24.00	24.00
Wrought iron bars	4.40	4.40	4.40	4.40

Wire and Wire Products: (Cents Per Lb.)	Dec. 14, 1942	Dec. 8, 1942	Nov. 17, 1942	Dec. 15, 1941
Plain wire	2.60	2.60	2.60	2.60
Wire nails	2.55	2.55	2.55	2.55

Rails: (Dollars Per Gross Ton)	Dec. 14, 1942	Dec. 8, 1942	Nov. 17, 1942	Dec. 15, 1941
Heavy rails	\$40.00	\$40.00	\$40.00	\$40.00
Light rails	40.00	40.00	40.00	40.00

Semi-Finished Steel: (Dollars Per Gross Ton)	Dec. 14, 1942	Dec. 8, 1942	Nov. 17, 1942	Dec. 15, 1941
Rerolling billets	\$34.00	\$34.00	\$34.00	\$34.00
Sheet bars	34.00	34.00	34.00	34.00
Slabs	34.00	34.00	34.00	34.00
Forging billets	40.00	40.00	40.00	40.00
Alloy blooms, billets, slabs	54.00	54.00	54.00	54.00

Wire Rods and Skelp: (Cents Per Lb.)	Dec. 14, 1942	Dec. 8, 1942	Nov. 17, 1942	Dec. 15, 1941
Wire rods	2.00	2.00	2.00	2.00
Skelp (grvd)	1.90	1.90	1.90	1.90

The various basing points for finished and semi-finished steel are listed in the detailed price tables, pages 138 to 144 herein.

Pig Iron: (Per Gross Ton)	Dec. 14, 1942	Dec. 8, 1942	Nov. 19, 1942	Dec. 15, 1941
No. 2 fdy., Philadelphia	\$25.89	\$25.89	\$25.89	\$25.84
No. 2, Valley furnace	24.00	24.00	24.00	24.00
No. 2, Southern Cin'ti	24.68	24.68	24.68	24.06
No. 2, Birmingham	20.38	20.38	20.38	20.38
No. 2, foundry, Chicago†	24.00	24.00	24.00	24.00
Basic, del'd eastern Pa.	25.39	25.39	25.39	25.34
Basic, Valley furnace	23.50	23.50	23.50	23.50
Malleable, Chicago†	24.00	24.00	24.00	24.00
Malleable, Valley	24.00	24.00	24.00	24.00
L. S. charcoal, Chicago	31.34	31.34	31.34	31.34
Ferromanganese‡	135.00	135.00	135.00	120.00

†The switching charge for delivery to foundries in the Chicago district is 60c. per ton.
‡For carlots at seaboard.

Scrap: (Per Gross Ton)	Dec. 14, 1942	Dec. 8, 1942	Nov. 17, 1942	Dec. 15, 1941
Heavy melting steel, P'gh.	\$20.00	\$20.00	\$20.00	\$20.00
Heavy melt'g steel, Phila.	18.75	18.75	18.75	18.75
Heavy melt'g steel, Ch'go	18.75	18.75	18.75	18.75
No. 1 hy. comp. sheet, Det.	17.85	17.85	17.85	17.85
Low phos. plate, Youngs'n	22.50	22.50	22.50	23.00
No. 1 cast, Pittsburgh	20.00	20.00	20.00	22.00
No. 1 cast, Philadelphia	20.00	20.00	20.00	24.00
No. 1 cast, Ch'go	20.00	20.00	20.00	20.00

Coke, Connellsville: (Per Net Ton at Oven)	Dec. 14, 1942	Dec. 8, 1942	Nov. 17, 1942	Dec. 15, 1941
Furnace coke, prompt	\$6.00	\$6.00	\$6.00	\$6.125
Foundry coke, prompt	6.875	6.875	6.875	6.875

Non-Ferrous Metals: (Cents per Lb. to Large Buyers)	Dec. 14, 1942	Dec. 8, 1942	Nov. 17, 1942	Dec. 15, 1941
Copper, electro., Conn.	12.00	12.00	12.00	12.00
Copper, Lake, New York	12.00	12.00	12.00	12.00
Tin (Straits), New York	52.00	52.00	52.00	52.00
Zinc, East St. Louis	8.25	8.25	8.25	8.25
Lead, St. Louis	6.35	6.35	6.35	5.70
Antimony (Asiatic), N. Y.	16.50	16.50	16.50	16.50

Comparison of Prices . . .

FINISHED STEEL	
Dec. 14, 1942	2.30467c. a Lb.
One week ago	2.30467c. a Lb.
One month ago	2.30467c. a Lb.
One year ago	2.30467c. a Lb.

	HIGH	LOW
1942	2.30467c.,	2.30467c.,
1941	2.30467c.,	2.30467c.,
1940	2.30467c., Jan. 2	2.24107c., Apr. 16
1939	2.35367c., Jan. 3	2.26689c., May 16
1938	2.58414c., Jan. 4	2.27207c., Oct. 18
1937	2.58414c., Mar. 9	2.32263c., Jan. 4
1936	2.32263c., Dec. 28	2.05200c., Mar. 10
1935	2.07642c., Oct. 1	2.06492c., Jan. 8
1934	2.15367c., Apr. 24	1.95757c., Jan. 2
1933	1.95578c., Oct. 3	1.75836c., May 2
1932	1.89196c., July 5	1.83901c., Mar. 1
1931	1.99629c., Jan. 13	1.86586c., Dec. 29
1930	2.25488c., Jan. 7	1.97319c., Dec. 9
1929	2.31773c., May 28	2.26498c., Oct. 29

Weighted index based on steel bars, beams, tank plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing 78 per cent of the United States output. Index recapitulated in Aug. 28, 1941, issue.

PIG IRON	
23.61 a Gross Ton	23.61 a Gross Ton
23.61 a Gross Ton	23.61 a Gross Ton
23.61 a Gross Ton	23.61 a Gross Ton
23.61 a Gross Ton	23.61 a Gross Ton

	HIGH	LOW
23.61	\$23.61	\$23.61
23.61, Mar. 20	\$23.45, Jan. 2	
23.45, Dec. 23	22.61, Jan. 2	
22.61, Sept. 19	20.61, Sept. 12	
23.25, June 21	19.61, July 6	
23.25, Mar. 9	20.25, Feb. 16	
19.74, Nov. 24	18.73, Aug. 11	
18.84, Nov. 5	17.83, May 14	
17.90, May 1	16.90, Jan. 27	
16.90, Dec. 5	13.56, Jan. 3	
14.81, Jan. 5	13.56, Dec. 6	
15.90, Jan. 6	14.79, Dec. 15	
18.21, Jan. 7	15.90, Dec. 16	
18.71, May 14	18.21, Dec. 17	

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Southern iron at Cincinnati.

SCRAP STEEL	
\$19.17 a Gross Ton	\$19.17 a Gross Ton
\$19.17 a Gross Ton	\$19.17 a Gross Ton
\$19.17 a Gross Ton	\$19.17 a Gross Ton
\$19.17 a Gross Ton	\$19.17 a Gross Ton

	HIGH	LOW
\$19.17	\$19.17	\$19.17
\$22.00, Jan. 7	\$19.17, Apr. 10	
21.83, Dec. 30	16.04, Apr. 9	
22.50, Oct. 3	14.08, May 16	
15.00, Nov. 22	11.00, June 7	
21.92, Mar. 30	12.67, June 9	
17.75, Dec. 21	12.67, June 9	
13.42, Dec. 10	10.33, Apr. 29	
13.00, Mar. 13	9.50, Sept. 25	
12.25, Aug. 8	6.75, Jan. 3	
8.50, Jan. 12	6.43, July 5	
11.33, Jan. 6	8.50, Dec. 29	
15.00, Feb. 18	11.25, Dec. 9	
17.58, Jan. 29	14.08, Dec. 3	

Based on No. 1 heavy melting steel scrap quotations to consumers at Pittsburgh, Philadelphia and Chicago.

Prices of Finished Iron and Steel...

Steel prices shown here are f.o.b. basing points, in cents per lb., unless otherwise indicated. On some products either quantity deductions or quantity extras apply. In many cases gage, width, cutting, physical, chemical extras, etc., apply to the base price. Actual realized prices to the mill, therefore, are affected by extras, reductions, and in most cases freight absorbed to meet competition. Delivered prices do not reflect new 3 per cent tax on freight rates.

Basing Point ↓ Product													10 DELIVERED TO		
	Pitts- burgh	Chicago	Gary	Cleve- land	Birm- ingham	Buffalo	Youngs- town	Spar- rows Point	Granite City	Middle- town, Ohio	Gulf Ports, Cars	Pacific Ports, Cars	Detroit	New York	Phila- delphia
SHEETS															
Hot rolled	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.20¢	2.10¢		2.65¢	2.22¢	2.35¢	2.28¢
Cold rolled ¹	3.05¢	3.05¢	3.05¢	3.05¢		3.05¢	3.05¢		3.15¢	3.05¢		3.70¢	3.17¢	3.41¢	3.39¢
Galvanized (24 ga.)	3.50¢	3.50¢	3.50¢		3.50¢	3.50¢	3.50¢	3.50¢	3.60¢	3.50¢		4.05¢		3.75¢	3.68¢
Enameling (20 ga.)	3.35¢	3.35¢	3.35¢	3.35¢			3.35¢		3.45¢	3.35¢		4.00¢	3.47¢	3.73¢	3.69¢
Long ternes ²	3.80¢		3.80¢									4.55¢		4.18¢	4.14¢
STRIP															
Hot rolled ³	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢		2.10¢			2.10¢		2.75¢	2.22¢	2.48¢	
Cold rolled ⁴	2.80¢	2.90¢		2.80¢			2.80¢	(Worcester = 3.00¢)					2.92¢	3.18¢	
Cooperage stock	2.20¢	2.20¢			2.20¢		2.20¢							2.58¢	
Commodity C-R	2.95¢			2.95¢			2.95¢	(Worcester = 3.35¢)					3.07¢	3.33¢	
TIN MILL PRODUCTS															
Coke tin plate, base box	\$5.00	\$5.00	\$5.00						\$5.10					5.38¢	5.34¢
Electrolytic tin plate, box	\$4.50		\$4.50												
Black plate, 29 gage ⁵	3.05¢	3.05¢	3.05¢						3.15¢			4.05¢ ¹²			3.39¢
Mfg. ternes, special box	\$4.30	\$4.30	\$4.30						\$4.40						
BARS															
Carbon steel	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢		(Duluth = 2.25¢)			2.52¢	2.80¢	2.27¢	2.51¢	2.49¢
Rail steel ⁶	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢					2.52¢	2.80¢			
Reinforcing (billet) ⁷	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢			2.52¢	2.55¢ ¹³	2.27¢	2.40¢	
Reinforcing (rail) ⁷	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢				2.52¢	2.55¢ ¹³	2.27¢		2.49¢
Cold finished ⁸	2.65¢	2.65¢	2.65¢	2.65¢		2.65¢				(Detroit = 2.70¢)				3.01¢	2.99¢
Alloy, hot rolled	2.70¢	2.70¢				2.70¢		Bethlehem, Massillon, Canton = 2.70¢					2.82¢		
Alloy, cold drawn	3.35¢	3.35¢	3.35¢	3.35¢		3.35¢							3.47¢		
								(Coatesville and Claymont = 2.10¢)							
PLATES															
Carbon steel	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢		2.10¢	2.10¢	2.25¢ ¹¹		2.47¢	2.65¢	2.33¢	2.30¢	2.155¢
Floor plates	3.35¢	3.35¢									3.72¢	4.00¢		3.73¢	3.69¢
Alloy	3.50¢	3.50¢									3.97¢	4.15¢		3.71¢	3.60¢
								(Coatesville = 3.50¢)							
SHAPES															
Structural	2.10¢	2.10¢	2.10¢		2.10¢	2.10¢		(Bethlehem = 2.10¢)			2.47¢	2.75¢		2.28¢	2.22¢
SPRING STEEL, C-R															
0.26 to 0.50 Carbon	2.80¢			2.80¢				(Worcester = 3.00¢)							
0.51 to 0.75 Carbon	4.30¢			4.30¢				(Worcester = 4.50¢)							
0.76 to 1.00 Carbon	6.15¢			6.15¢				(Worcester = 6.35¢)							
1.01 to 1.25 Carbon	8.35¢			8.35¢				(Worcester = 8.55¢)							
WIRE⁹															
Bright ¹⁵	2.60¢	2.60¢		2.60¢	2.60¢			(Worcester = 2.70¢)				3.10¢			2.94¢
Galvanized															
Spring (High Carbon)	3.20¢	3.20¢		3.20¢				(Worcester = 3.30¢)				3.70¢			3.54¢
PILING															
Steel sheet	2.40¢	2.40¢				2.40¢						2.95¢			2.74¢

¹ Mill run sheets are 10c. per 100 lb. less than base; and primes only, 25c. above base. ² Unassorted 8-lb. coating. ³ Widths up to 12 in. ⁴ Carbon 0.25 per cent and less. ⁵ Applies to certain width and length limitations. ⁶ For merchant trade. ⁷ Prices for straight length material only, from a producer to a consumer. Functional discount of 25c. per 100 lb. to fabricators. ⁸ Also shafting. For quantities of 20,000 to 39,999 lb. ⁹ Carload lot to manufacturing trade. ¹⁰ These prices do not apply if the customary means of transportation (rail and water) are not used. ¹¹ Ship plates only. ¹² Boxed. ¹³ Portland and Seattle price, San Francisco price is 2.50c. ¹⁴ This bright wire base price to be used in figuring annealed and bright finish wires, commercial spring wire and galvanized wire.

GOVERNMENT CEILINGS—Price Schedule No. 6 issued April 16, 1941, governs steel mill prices; Price Schedule No. 49 governs warehouse prices, which are on another page of this issue.

EXCEPTIONS TO PRICE SCHEDULE No. 6—On hot rolled carbon bars, Phoenix Iron Co. may quote 2.35c. at established basing points; Calumet Steel division of Borg Warner may quote 2.35c., Chicago, on bars from its 8-in. mill; Joslyn Mfg. Co. may quote 2.35c., Chicago base. On rail steel bars Sweets Steel Co. may quote 2.33c., f.o.b. mill. On hot rolled sheets, Andrews Steel Co. may quote for shipment to Detroit area on Middletown base. On galvanized sheets, Andrews Steel may quote 3.75c., at established basing points. On hot rolled strip, Joslyn Mfg. Co. may quote 2.30c., Chicago base. On plates, Granite City Steel Co. may quote 2.35c., f.o.b. mill, and Central Iron & Steel Co. may quote 2.20c., f.o.b. basing points. On shapes, Phoenix Iron Co. may quote 2.30c. established basing points and 2.50c. Phoenixville for export.

On rail steel merchant bars, Eckels-Nye Corp. may charge 2.40c. On tubing, South Chester Tube Co. may price Gulf or Pacific Coast all-rail shipments and shipments west of Harrisburg on basis of f.o.b. Chester. On lend-lease sales to eastern seaboard, Sheffield Steel Co. and Colorado Fuel & Iron Corp. may sell f.o.b. mill. SEMIFINISHED STEEL—Follansbee Steel Corp. may sell forging billets at \$49.50 f.o.b. Toronto; Continental Steel Corp. may sell Acme Steel Co. at \$34 for rerolling billets plus extras and freight; Ford Motor Co. may sell rerolling billets at \$34 f.o.b. Dearborn; Andrews Steel Co. may sell forging billets at \$50 at established basing points and slabs at \$41; Empire Sheet and Tin Plate may sell slabs at \$41 at established basing points and sheet bars at \$39 f.o.b. mill; on lend-lease sales Northwestern Steel & Wire Co. may charge \$41 per gross ton f.o.b. mill for rerolling billets; on lend-lease sales Wheeling Steel Corp. may charge \$36 per ton for small billets, f.o.b. Portsmouth and \$37 per ton for sheet bars f.o.b. Portsmouth; Laclede Steel Co. on semifinished sales for lend-lease shipped to eastern seaboard may use Chicago basing point prices f.o.b. Alton and Madison, Ill. ALLOY STEEL BARS—Texas Steel Co. may use Chicago base f.o.b. Fort Worth.

PRICES

SEMI-FINISHED STEEL

For exceptions, see preceding page

Billets, Blooms and Slabs

Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham, Sparrows Point (rerolling only). Prices delivered Detroit are \$2.25 higher; f.o.b. Duluth, billets only, \$2 higher. Delivered prices do not reflect new per cent tax on freight rates.

Per Gross Ton

Rerolling \$34.00
Forging quality 40.00

Alloy Steel: Pittsburgh, Chicago, Canton, Massillon, Buffalo, or Bethlehem, per gross ton..... \$54.00

Shell Steel

Per Gross Ton

3 in. to 12 in. \$52.00
12 in. to 18 in. 54.00
18 in. and over 56.00

Basic open hearth shell steel, f.o.b. Pittsburgh, Chicago, Buffalo, Gary, Cleveland, Youngstown and Birmingham.

Prices delivered Detroit are \$2.25 higher.

Note: The above base prices apply on lots of 1000 tons of a size and section to which are to be added extras for chemical requirements, cutting, or quantity.

Sheet Bars

Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

Per Gross Ton

Open hearth or bessemer \$34.00

Skelp

Pittsburgh, Chicago, Youngstown, Coatesville, Pa., Sparrows Point, Md.

Per Lb.

Grooved, universal and sheared ... 1.90c.

Wire Rods

(No. 5 to 9/32 in.)

Per Lb.

Pittsburgh, Chicago, Cleveland ... 2.00c.
Worcester, Mass. 2.10c.
Birmingham 2.00c.
San Francisco 2.50c.
Galveston 2.25c.

9/32 in. to 47/64 in., 0.15c. a lb. higher. Quantity extras apply.

TOOL STEEL

(F.o.b. Pittsburgh, Bethlehem, Syracuse)

Base per lb.

High speed 67c.
Straight molybdenum 54c.
Tungsten-molybdenum 57½c.
High-carbon-chromium 43c.
Oil hardening 24c.
Special carbon 22c.
Extra carbon 18c.
Regular carbon 14c.

Warehouse prices east of Mississippi are 2c. a lb. higher; west of Mississippi, 3c. higher.

CORROSION AND HEAT-RESISTING STEEL

(Per lb. base price, f.o.b. Pittsburgh)

Chromium-Nickel Alloys

	No. 304	No. 302
Forging billets	21.25c.	20.40c.
Bars	25.00c.	24.00c.
Plates	29.00c.	27.00c.
Structural shapes	25.00c.	24.00c.
Sheets	36.00c.	34.00c.
Hot rolled strip	23.50c.	21.50c.
Cold rolled strip	30.00c.	28.00c.
Drawn wire	25.00c.	24.00c.

Straight-Chromium Alloys

	No. 410	No. 430	No. 442	No. 446
F. Billets	15.725c.	16.15c.	19.125c.	23.375c.
Bars	18.50c.	19.00c.	22.50c.	27.50c.
Plates	21.50c.	22.00c.	25.50c.	30.50c.
Sheets	26.50c.	29.00c.	32.50c.	36.50c.
Hotstrip	17.00c.	17.50c.	24.00c.	35.00c.
Cold st.	22.00c.	22.50c.	32.00c.	52.00c.

Chromium-Nickel Clad Steel (20%)

	No. 304
Plates	18.00c.*
Sheets	19.00c.

*Includes annealing and pickling.

NATIONAL EMERGENCY STEELS (Hot Rolled)

Extras for Alloy Content

Designation	CHEMICAL COMPOSITION LIMITS, PER CENT								Basic Open-Hearth		Electric Furnace	
	Carbon	Manganese	Phosphorus Max.	Sulfur Max.	Silicon	Chromium	Nickel	Molybdenum	Bars and Bar Strip	Billets, Blooms and Slabs	Bars and Bar Strip	Billets, Blooms and Slabs
NE 1330	.28/.33	1.80/1.90	.040	.040	.20/.35				.10c	\$2.00		
NE 1335	.33/.38	1.80/1.90	.040	.040	.20/.35				.10	2.00		
NE 1340	.38/.43	1.80/1.90	.040	.040	.20/.35				.10	2.00		
NE 1345	.43/.48	1.80/1.90	.040	.040	.20/.35				.10	2.00		
NE 1350	.48/.53	1.80/1.90	.040	.040	.20/.35				.10	2.00		
NE 8020	.18/.23	1.80/1.30	.040	.040	.20/.35			.10/.20	.45	9.00	.95c	\$19.00
NE 8022	.20/.25	1.00/1.30	.040	.040	.20/.35			.10/.20	.45	9.00	.95	19.00
NE 8339	.37/.42	1.30/1.60	.040	.040	.20/.35			.20/.30	.75	15.00	1.25	25.00
NE 8442*	.40/.45	1.30/1.60	.040	.040	.20/.35			.30/.40	.90	18.00	1.40	28.00
NE 8613	.12/.17	.70/.90	.040	.040	.20/.35	.40/.60	.40/.60	.15/.25	.75	15.00	1.25	25.00
NE 8615	.13/.18	.70/.90	.040	.040	.20/.35	.40/.60	.40/.60	.15/.25	.75	15.00	1.25	25.00
NE 8617	.15/.20	.70/.90	.040	.040	.20/.35	.40/.60	.40/.60	.15/.25	.75	15.00	1.25	25.00
NE 8629	.18/.23	.70/.90	.040	.040	.20/.35	.40/.60	.40/.60	.15/.25	.75	15.00	1.25	25.00
NE 8630	.28/.33	.70/.90	.040	.040	.20/.35	.40/.60	.40/.60	.15/.25	.75	15.00	1.25	25.00
NE 8715	.13/.18	.70/.90	.040	.040	.20/.35	.40/.60	.40/.60	.20/.30	.80	16.00	1.30	26.00
NE 8720	.18/.23	.70/.90	.040	.040	.20/.35	.40/.60	.40/.60	.20/.30	.80	16.00	1.30	26.00
NE 8722	.20/.25	.70/.90	.040	.040	.20/.35	.40/.60	.40/.60	.20/.30	.80	16.00	1.30	26.00
NE 8725	.33/.38	.75/1.00	.040	.040	.20/.35	.40/.60	.40/.60	.20/.30	.80	16.00	1.30	26.00
NE 8729	.35/.40	.75/1.00	.040	.040	.20/.35	.40/.60	.40/.60	.20/.30	.80	16.00	1.30	26.00
NE 8740	.28/.43	.75/1.00	.040	.040	.20/.35	.40/.60	.40/.60	.20/.30	.80	16.00	1.30	26.00
NE 8744	.40/.45	.75/1.00	.040	.040	.20/.35	.40/.60	.40/.60	.20/.30	.80	16.00	1.30	26.00
NE 8749	.45/.50	.75/1.00	.040	.040	.20/.35	.40/.60	.40/.60	.20/.30	.80	16.00	1.30	26.00
NE 8949*	.45/.50	1.00/1.30	.040	.040	.20/.35	.40/.60	.40/.60	.30/.40	1.20	24.00	1.70	34.00
NE 9255	.50/.60	.70/.95	.040	.040	1.80/2.20				.40c	8.00		
NE 9260	.55/.65	.75/1.00	.040	.040	1.80/2.20				.48	8.00		
NE 9262	.55/.65	.75/1.00	.040	.040	1.80/2.20	.20/.40			.65	13.00		
NE 9415	.13/.18	.80/1.10	.040	.040	.40/.60	.20/.40	.20/.40	.08/.15	.80	16.00	1.30c	\$26.00
NE 9420	.18/.23	.80/1.10	.040	.040	.40/.60	.20/.40	.20/.40	.08/.15	.80	16.00	1.30	26.00
NE 9422	.20/.25	.80/1.10	.040	.040	.40/.60	.20/.40	.20/.40	.08/.15	.80	16.00	1.30	26.00
NE 9430	.28/.33	.90/1.20	.040	.040	.40/.60	.20/.40	.20/.40	.08/.15	.80	16.00	1.30	26.00
NE 9435	.33/.38	.90/1.20	.040	.040	.40/.60	.20/.40	.20/.40	.08/.15	.80	16.00	1.30	26.00
NE 9437	.35/.40	.90/1.20	.040	.040	.40/.60	.20/.40	.20/.40	.08/.15	.80	16.00	1.30	26.00
NE 9440	.38/.43	.90/1.20	.040	.040	.40/.60	.20/.40	.20/.40	.08/.15	.80	16.00	1.30	26.00
NE 9442	.40/.45	1.00/1.30	.040	.040	.40/.60	.20/.40	.20/.40	.08/.15	.85	17.00	1.35	27.00
NE 9445	.43/.48	1.00/1.30	.040	.040	.40/.60	.20/.40	.20/.40	.08/.15	.85	17.00	1.35	27.00
NE 9450	.48/.53	1.20/1.50	.040	.040	.40/.60	.20/.40	.20/.40	.08/.15	.85	17.00	1.35	27.00
NE 9537*	.35/.40	1.20/1.50	.040	.040	.40/.60	.40/.60	.40/.60	.15/.25	1.20	24.00	1.70	34.00
NE 9540*	.38/.43	1.20/1.50	.040	.040	.40/.60	.40/.60	.40/.60	.15/.25	1.20	24.00	1.70	34.00
NE 9542*	.40/.45	1.20/1.50	.040	.040	.40/.60	.40/.60	.40/.60	.15/.25	1.20	24.00	1.70	34.00
NE 9550*	.48/.53	1.20/1.50	.040	.040	.40/.60	.40/.60	.40/.60	.15/.25	1.20	24.00	1.70	34.00
NE 9630	.28/.33	1.20/1.50	.040	.040	.40/.60	.40/.60			.80	16.00	1.30	26.00
NE 9635	.33/.38	1.20/1.50	.040	.040	.40/.60	.40/.60			.80	16.00	1.30	26.00
NE 9637	.35/.40	1.20/1.50	.040	.040	.40/.60	.40/.60			.80	16.00	1.30	26.00
NE 9640	.38/.43	1.20/1.50	.040	.040	.40/.60	.40/.60			.80	16.00	1.30	26.00
NE 9642	.40/.45	1.30/1.60	.040	.040	.40/.60	.40/.60			.85	17.00	1.35	27.00
NE 9645	.43/.48	1.30/1.60	.040	.040	.40/.60	.40/.60			.85	17.00	1.35	27.00
NE 9650	.48/.53	1.30/1.60	.040	.040	.40/.60	.40/.60			.85	17.00	1.35	27.00

*Recommended for large sections only.

Note: The extras shown above are in addition to a base price of 2.70c. per 100 lb., on finished products and \$54 per gross ton on semi-finished steel major basing points and are in cents per 100 lb. and dollars per gross ton in semi-finished.

ELECTRICAL SHEETS

(Base, f.o.b. Pittsburgh) Per Lb.

Field grade 3.20c.
Armature 3.55c.
Electrical 4.05c.
Motor 4.95c.
Dynamo 5.65c.
Transformer 72 6.15c.
Transformer 65 7.15c.
Transformer 58 7.65c.
Transformer 52 8.45c.

F.o.b. Granite City, add 10c. per 100 lb. on field grade to and including dynamo. Pacific ports add 75c. per 100 lb. on all grades.

WIRE PRODUCTS

To the trade, f.o.b. Pittsburgh, Chicago, Cleveland, Birmingham

Base per Keg

Standard wire nails \$2.55
Coated nails 2.55
Cutnails, carloads 3.85

Base per 100 Lb.

Annealed fence wire \$3.05
Annealed galvanized fence wire 3.40

Base Column

Woven wire fence* 67
Fence posts (carloads) 69
Single loop bale ties 59
Galvanized barbed wire† 70
Twisted barless wire 70

*15½ gage and heavier. †On 80-rod spools in carload quantities.

RAILS, TRACK SUPPLIES

(F.o.b. Mill)

Standard rails, heavier than 60 lb., gross ton \$40.00
Angle bars, 100 lb. 2.70

(F.o.b. Basing Points) Per Gross Ton

Light rails (from billets) \$40.00
Light rails (from rail steel) 39.00

Base per Lb.

Cut spikes 3.00c.
Screw spikes 5.15c.
Tie plates, steel 2.15c.
Tie plates, Pacific Coast 2.30c.
Track bolts 4.75c.
Track bolts, heat treated, to railroads 5.00c.
Track bolts, jobbers discount 63-5

Basing Points, light rails—Pittsburgh, Chicago, Birmingham; spikes and tie plates—Pittsburgh, Chicago, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; tie plates alone—Steelton, Pa.; Buffalo; spikes alone—Youngstown, Lebanon, Pa., Richmond.

ROOFING TERNE PLATE

(F.o.b. Pittsburgh, 112 Sheets)

	20x14 in.	20x28 in.
8-lb. coating I.C. ...	\$6.00	\$12.00
15-lb. coating I.C. ...	7.00	14.00
20-lb. coating I.C. ...	7.50	15.00

The secret of making Better Tool Steels ...EXPERIENCE



Starting with the manufacture of America's first crucible saw steel in 1855, Henry Disston & Sons, Inc., has acquired a wealth of experience in the making of fine tool steels. Progress and improvement in practice and equipment over many years have established the present Disston standards and methods.

None but the purest obtainable materials are used. Scrap is segregated. Charges are melted in modern electric furnaces. Shallow ladles and small molds are used to get ideal reduction to rolled size. All operations are in the charge of specialists trained in the Disston tradition.

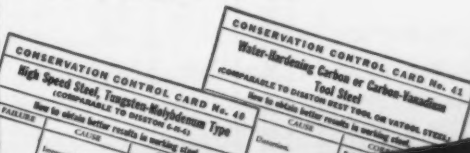
Under accurate metallurgical and chemical control, Disston produces precisely made alloy and carbon steels, with predetermined grain size, extraordinary soundness and unusual cleanliness. There is, for example, Disston 6-N-6

High Speed Steel—a fine high speed steel that combines extreme toughness and remarkable wear resistance with excellent response to heat treatment.

Have you a tool steel problem? Disston engineers and metallurgists are at your service to help you determine the best tool steels for long life and better performance . . . And if you have not received your free copy of the illustrated 73-page book, "Disston Tool Steels," write today to Henry Disston & Sons, Inc., 1219 Tacony, Philadelphia, Pa., U. S. A.

DISSTON CONSERVATION CONTROL CARDS

Write for these informative cards containing valuable material on the selection, working and application of six different tool steels. They are supplied *without charge* as part of the Disston Conservation Control Plan to save essential tools and materials.



**GET YOUR SCRAP
INTO THE SCRAP!**

PRICES

BOLTS, NUTS, RIVETS, SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Machine and Carriage Bolts:

	Per Cent off List
1/2 in. & smaller x 6 in. & shorter	65 1/2
9/16 & 5/8 in. x 6 in. & shorter	63 1/2
3/4 to 1 in. x 6 in. & shorter	61
1 1/8 in. and larger, all length	59
All diameters over 6 in. long	59
Lag, all sizes	62
Plow bolts	65

Nuts, Cold Punched or Hot Pressed:

	(Hexagon or Square)
1/2 in. and smaller	62
9/16 to 1 in. inclusive	59
1 1/8 to 1 1/2 in. inclusive	57
1 1/2 in. and larger	56

On above bolts and nuts, excepting plow bolts, additional allowance of 10 per cent for full container quantities. There is an additional 5 per cent allowance for carload shipments.

Semi-Fin. Hexagon Nuts U.S.S. S.A.E.

	U.S.S.	S.A.E.
7/16 in. and smaller	64	
1/2 in. and smaller	62	
1/2 in. through 1 in.		60
9/16 to 1 in.	59	
1 1/8 in. through 1 1/2 in.	57	58
1 1/2 in. and larger	56	

In full container lots, 10 per cent additional discount.

Stove Bolts

Packages, nuts loose..... 71 and 10
In packages, with nuts attached..... 71
In bulk..... 80

On stove bolts freight allowed up to 65c. per 100 lb. based on Cleveland, Chicago, New York on lots of 200 lb. or over.

Large Rivets (1/2 in. and larger)

Base per 100 lb.
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham.....\$3.75

Small Rivets (7/16 in. and smaller)

Per Cent Off List
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham.....65 and 5

Cap and Set Screws Per Cent Off List

Upset full fin. hexagon head cap screws, coarse or fine thread, up to and incl. 1 in. x 6 in. 64
Upset set screws, cup and oval points 71
Milled studs 46
Flat head cap screws, listed sizes.... 36
Fillister head cap, listed sizes 51

Freight allowed up to 65c. per 100 lb. based on Cleveland, Chicago or New York on lots of 200 lb. or over.

PIG IRON

All prices set in bold face type are maxima established by OPA on June 24, 1941. Other domestic prices (in italics) are delivered quotations per gross ton computed on the basis of the official maxima. Delivered prices do not reflect new 3 per cent tax on freight rates.

	No. 2 Foundry	Basic	Bessemer	Malleable	Low Phosphorus	Charcoal
Boston††	\$25.53	\$25.03	\$26.53	\$26.03		
Brooklyn	27.65			28.15		
Jersey City	26.62	26.12	27.62	27.12		
Philadelphia	25.89	25.39	26.89	26.39		
Bethlehem, Pa.	\$25.00	\$24.50	\$26.00	\$25.50		
Everett, Mass.††	25.00	24.50	26.00	25.50		
Swedeland, Pa.	25.00	24.50	26.00	25.50		
Steelton, Pa.	25.00	24.50	26.00	25.50	\$29.50	
Birdsboro, Pa.	25.00	24.50	26.00	25.50	29.50	
Sparrows Point, Md.	25.00	24.50	26.00	25.50		
Erie, Pa.	24.00	23.50	25.00	24.50		
Neville Island, Pa.	24.00	23.50	24.50	24.00		
Sharpsville, Pa.*	24.00	23.50	24.50	24.00		
Buffalo	24.00	23.00	25.00	24.50	29.60	
Cincinnati	24.68	24.68		25.18		
Canton, Ohio	25.47	24.97	25.97	25.47		
Mansfield, Ohio	26.06	25.56	26.56	26.06		
St. Louis	24.50	24.00				
Chicago	24.00	23.50	24.50	24.00		\$31.34
Granite City, Ill.	24.00	23.50	24.50	24.00		
Cleveland	24.00	23.50	24.50	24.00		
Hamilton, Ohio	24.00	23.50	24.50	24.00		
Toledo	24.00	23.50	24.50	24.00		
Youngstown	24.00	23.50	24.50	24.00		
Detroit	24.00	23.50	24.50	24.00		
Lake Superior Co.						\$28.00
Lyles, Tenn. Co.†						33.00
St. Paul	26.76		27.26	26.76		
Duluth	24.50	24.00	25.00	24.50		
Birmingham	20.38	19.00	25.00			
Los Angeles	27.25					
San Francisco	27.25					
Seattle	27.25					
Provo, Utah	22.00					
Montreal	27.50	27.50		28.00		
Toronto	25.50	25.50		26.00		

GRAY FORGE IRON: Valley or Pittsburgh furnace..... \$23.50

*Pittsburgh Coke & Iron Co. (Sharpsville, Pa., furnace only) and the Struthers Iron and Steel Co., Struthers, Ohio, may charge 50c. a ton in excess of basing point prices for No. 2 foundry, basic, bessemer and malleable.

†Pittsburgh Ferromanganese Co. (Chester furnace only) may charge \$2.25 a ton over maximum basing point prices.

†Price shown is for low-phosphorous iron; high-phosphorous sells for \$28.50 at the furnace. ††Eastern Gas & Fuel Associates, Boston, is permitted to sell pig iron produced by its selling company, Mystic Iron Works, Everett, Mass., at \$1 per gross ton above maximum prices.


Delta Chemical & Iron Co., Chicago, may charge \$30 for charcoal iron at its Delta, Mich., furnace.

Basing point prices are subject to switching charges; silicon differentials (not to exceed 50c. a ton for each 0.25 per cent silicon content in excess of base grade which is 1.75 per cent to 2.25 per cent); phosphorous differentials, a reduction of 38c. per ton for phosphorous content of 0.70 per cent and over; manganese differentials, a charge not to exceed 50c. per ton for each 0.50 per cent manganese content in excess of 1.00 per cent.

WAREHOUSE PRICES (Delivered Metropolitan areas, per 100 lb. These prices do not necessarily apply for dislocated tonnage shipments when the f.o.b. City prices are used in conformance with OPA Schedule 49)

CITIES	SHEETS			STRIP		Plates (1/4 in. and heavier)	Structural Shapes	BARS		ALLOY BARS			
	Hot Rolled (10 ga.)	Cold Rolled	Galv. (24 ga.)	Hot Rolled	Cold Rolled			Hot Rolled	Cold Finished	Hot Rolled 2300	Hot Rolled 3100	Cold Drawn 2300	Cold Drawn 3100
Pittsburgh	\$3.35		\$4.65	\$3.60	\$3.20	\$3.40	\$3.40	\$3.35	\$3.65	\$7.45	\$5.75	\$8.40	\$6.75
Chicago	3.25	\$4.10	4.85 ¹	3.60	3.50	3.55	3.55	3.50	3.75	7.35	5.65	8.40	6.75
Cleveland	3.35	4.05	4.62	3.50	3.20	3.40	3.58	3.25	3.75	7.55	5.85	8.40	6.75
Philadelphia	3.55	4.05 ⁵	4.65	3.51	3.31	3.55	3.55	3.85	4.08	7.31	5.88	8.56	7.18
New York	3.58	4.60 ²	5.00	3.96 ⁶	3.51	3.76	3.75	3.84	4.09	7.60	5.90	8.84	7.19
Detroit	3.43	4.30	4.84 ¹	3.68 ⁶	3.40	3.60	3.65	3.43	3.80	7.67	5.97	8.70	7.05
Buffalo	3.25	4.30 ¹	4.75 ⁴	3.82	3.52	3.62	3.40	3.35	3.75	7.35	5.65	8.40	6.75
Boston	3.71	4.68	5.11	4 (6)	3.46	3.85	3.85	3.98	4.13	7.77	6.07	8.91	7.26
Birmingham	3.45 ³		4.75 ¹	3.70 ³		3.55 ³	3.55 ³	3.50 ³	4.48				
St. Louis	3.39	4.24 ²	4.99 ¹	3.74	3.61	3.69	3.69	3.64	4.02	7.72	6.02	8.77	7.12
St. Paul	3.50	4.35	5.00	3.85	3.83	3.80	3.80	3.75	4.34	7.45	6.00	8.84	7.44
Milwaukee	3.38	4.23 ²	4.98 ¹	3.73	3.54	3.68	3.68	3.63	3.88	7.58	5.88	8.63	6.98
Baltimore	3.50		5.05	4.00		3.70	3.70	3.85	4.04				
Cincinnati	3.42	4.37 ²	4.42 ¹	3.67	3.45	3.65	3.68	3.60	4.00	7.69	5.99	8.50	7.10
Norfolk	3.85		5.40	4.10		4.05	4.05	4.00	4.15				
Washington	3.60			4.10		3.80	3.80	3.95	4.10				
Indianapolis	3.45	4.25	5.01 ¹	3.75	3.28	3.70	3.70	3.60	3.97	7.67	5.97	8.72	7.07
Omaha	3.85		5.52 ¹	4.20		4.15	4.15	4.10	4.42				
Memphis	3.85		5.25	4.10		3.95	3.95	4.10	4.31				
New Orleans	4.05			4.30		3.90	3.90	4.00	4.60				
Houston	4.00			4.30		4.05	4.05	3.75					
Los Angeles†	4.95	7.15	5.95	4.90		4.90	4.60	4.35	6.60	9.55	8.55	10.55	9.55
San Francisco†	4.55	7.05	6.10	4.50		4.65	4.35	3.95	6.80	9.80	8.80	10.80	9.80
Seattle†	4.65 ⁷		5.70 ⁷	4.25		4.75	4.45	4.20	5.75		8.00		

BASE QUANTITIES: Hot rolled sheets, cold rolled sheets, hot rolled strip, plates, shapes and hot rolled bars, 400 to 1999 lb., galvanized sheets, 150 to 1499 lb.; cold rolled strip, extras apply on all quantities; cold finished bars, 1500 lb. and over; SAE bars, 1000 lb. and over. Exceptions: † 500 to 1499 lb. * 400 to 1499 lb. * 450 to 1499 lb. * 1000 to 1999 lb. * 0 to 1999 lb. † 300 to 10,000 lb. At Philadelphia galvanized sheets, 25 or more bundles; Boston, cold rolled and galvanized sheets, 450 to 3749 lb.; San Francisco, hot rolled sheets, 400 to 39,999 lb., galvanized and cold rolled sheets, 750 to 4999 lb., cold fin. bars, 0-299 lb.; hot rolled alloy bars, 0-4999 lb.; Seattle, cold finished bars, 1000 lb. and over, hot rolled alloy bars, 0-1999 lb.; Memphis, hot rolled sheets, 400 to 1999 lb., galvanized sheets, 150 and over; St. Paul, galvanized and cold rolled sheets, any quantity, hot rolled bars, plates, shapes, hot rolled sheets, 400 to 14,999 lb.; Los Angeles, hot rolled sheets, bars, plates, cold rolled sheets, 300 to 1999 lb.; galvanized sheets, 1 to 6 bundles; cold finished bars, 1 to 99 lb.; SAE bars, 100 lb. Extras for size, quality, etc., apply on above quotations. * 12 gage and heavier, \$3.43. † Los Angeles, San Francisco and Seattle prices reflect special provisions of amendment No. 2 to OPA Price Schedule No. 49.



Proper re-sharpening extends broach life...

Information supplied by an Industrial publication

Proper re-sharpening of broaches is a very important factor in their continued performance. Tooth form, cutting hook and finish should conform as closely as possible to the original after re-sharpening.

There are two particular ways of determining when a broach should be re-sharpened. One consists of periodic examination of the finished work. The other, and more accurate, is examination of the broach itself.

If the work starts to show rough surfaces, or tears, it is a good indication that the broach is in need of

re-sharpening. But this method of checking is not recommended.

The best way is to examine the cutting edge of the broach teeth at regular intervals. When there is a shiny land on the tooth, or the edge is ragged, the broach should be sharpened.

The land should not be allowed to become too wide, because if it does, too much stock must be removed in re-sharpening. It is much better to re-sharpen oftener and thus extend the life of the broach.

CLIMAX FURNISHES AUTHORITATIVE ENGINEERING DATA ON MOLYBDENUM APPLICATIONS.
MOLYBDIC OXIDE—BRIQUETTED OR CANNED • FERROMOLYBDENUM • "CALCIUM MOLYBDATE"

Climax Molybdenum Company
500 Fifth Avenue • New York City

MOLY

PRICES

BOILER TUBES

Seamless Steel and Lap Weld Commercial
Boiler Tubes and Locomotive Tubes
Minimum Wall

(Net base prices per 100 ft. f.o.b. Pitts-
burgh, in carload lots)

		Seamless	Weld,
		Cold	Hot
		Drawn	Hot
		Roll	Roll
2 in. o.d. 13 B.W.G.	15.03	13.04	12.38
2 1/2 in. o.d. 12 B.W.G.	20.21	17.54	16.58
3 in. o.d. 12 B.W.G.	22.48	19.50	18.35
3 1/2 in. o.d. 11 B.W.G.	28.37	24.62	23.15
4 in. o.d. 10 B.W.G.	35.20	30.54	28.66

(Extras for less carload quantities)
40,000 lb. or ft. over Base
30,000 lb. or ft. to 39,999 lb. or ft. 5%
20,000 lb. or ft. to 29,999 lb. or ft. 10%
10,000 lb. or ft. to 19,999 lb. or ft. 20%
5,000 lb. or ft. to 9,999 lb. or ft. 30%
2,000 lb. or ft. to 4,999 lb. or ft. 45%
Under 2,000 lb. or ft. 65%

CAST IRON WATER PIPE

	Per Net Ton
6-in. and larger, del'd Chicago	\$54.80
6-in. and larger, del'd New York	52.20
6-in. and larger, Birmingham	46.00
6-in. and larger f.o.b. cars, San Francisco or Los Angeles	69.40
6-in. and larger f.o.b. cars, Seattle	71.20

Class "A" and gas pipe, \$3 extra; 4-in. pipe is \$3 a ton above 6-in. Prices shown are for lots of less than 200 tons. For 200 tons or over, 6-in. and larger is \$45 at Birmingham and \$53.80 delivered Chicago. \$59.40 at San Francisco and Los Angeles, and \$70.20 at Seattle. Delivered prices do not reflect new 3 per cent tax on freight rates.

WELDED PIPE AND TUBING

Base Discounts, f.o.b. Pittsburgh District
and Lorain, Ohio, Mills

(F.o.b. Pittsburgh only on wrought pipe)
Base Price—\$200 per Net Ton

Steel (Butt Weld)

	Black	Galv.
1/2 in.	63 1/2	51
3/4 in.	66 1/2	55
1 to 3 in.	68 1/2	57 1/2

Wrought Iron (Butt Weld)

1/2 in.	25	3 1/2
3/4 in.	30	10
1 and 1 1/4 in.	34	16
1 1/2 in.	38	18 1/2
2 in.	37 1/2	18

Steel (Lap Weld)

2 in.	61	49 1/2
2 1/2 and 3 in.	64	52 1/2
3 1/2 to 6 in.	66	54 1/2

Wrought Iron (Lap Weld)

2 in.	30 1/2	12
2 1/2 to 3 1/2 in.	31 1/2	14 1/2
4 in.	33 1/2	18
4 1/2 to 8 in.	32 1/2	17

Steel (Butt, extra strong, plain ends)

	Black	Galv.
1/2 in.	61 1/2	50 1/2
3/4 in.	65 1/2	54 1/2
1 to 3 in.	67	57

Wrought Iron (Same as Above)

1/2 in.	25	6
3/4 in.	31	12
1 to 2 in.	38	19 1/2

Steel (Lap, extra strong, plain ends)

2 in.	59	48 1/2
2 1/2 and 3 in.	63	52 1/2
3 1/2 to 6 in.	66 1/2	56

Wrought Iron (Same as Above)

2 in.	33 1/2	15 1/2
2 1/2 to 4 in.	39	22 1/2
4 1/2 to 6 in.	37 1/2	21

On butt weld and lap weld steel pipe jobbers are granted a discount of 5%. On less-than-carload shipments prices are determined by adding 25 and 30% and the carload freight rate to the base card.

F.o.b. Gary prices are two points lower discount or \$4 a ton higher than Pittsburgh or Lorain on lap weld and one point lower discount, or \$2 a ton higher on all butt weld.

Ferroalloys

Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans, Domestic, 80%, per gross ton (carloads)\$135.00

Spiegeleisen

Per Gross Ton Furnace
Domestic, 19 to 21%\$36.00
Domestic, 26 to 28% 49.50

Electric Ferrosilicon

(Per Gross Ton, Delivered Lump Size)
50% (carload lots, bulk)\$74.50
50% (ton lots, packed) 87.00
75% (carload lots, bulk)135.00
75% (ton lots, packed)151.00

Silvery Iron

(Per Gross Ton, base 6.00 to 6.50 %)
F.o.b. Jackson, Ohio\$29.50*
Buffalo 30.75
For each additional 0.50% silicon add \$1 a ton. For each 0.50% manganese over 1% add 50c. a ton. Add \$1 a ton for 0.75% phosphorus or over.
*Official OPA price established June 24, 1941.

Bessemer Ferrosilicon

Prices are \$1 a ton above Silvery Iron quotations of comparable analysis.

Ferrocchrome

(Per Lb., Contained Cr, Delivered Carload lots, Lump Size, on Contract)
4 to 6 carbon13.00c.
2 carbon19.50c.
1 carbon20.50c.
0.10 carbon22.50c.
0.06 carbon23.00c.

Spot prices are 1/4 c. per lb. of contained chromium higher.

Silico-Manganese

(Per Gross Ton, Delivered, Carloads, Bulk)
3 carbon\$120.00
2.50 carbon 125.00
2 carbon 130.00
1 carbon 140.00

Other Ferroalloys

Ferrotungsten, per lb. contained W, del'd carload \$2.00
Ferrotungsten, 100 lb. and less... 2.25
Ferrovanadium, contract, per lb. contained V, del'd\$2.70 to \$2.90†
Ferrocolumbium, per lb. contained Cb, f.o.b. Niagara Falls, N. Y., ton lots\$2.25†
Ferrocobalt, 15-18 Ti, 7-8 C, f.o.b. furnace, carload contract, net ton\$142.50
Ferrocobalt, 17-20 Ti, 3-5 C, f.o.b. furnace, carload contract, net ton\$157.50
Ferrophosphorus, electric or blast furnace materials, carloads, f.o.b. Anniston, Ala., for 18%, with \$3 unitage freight, equalized with Rockdale, Tenn., gross ton. \$58.50
Ferrophosphorus, electrolytic 23-26%, carlots, f.o.b. Monsanto (Siglo), Tenn., \$3 unitage, freight equalized with Nashville, gross ton\$75.00
Ferromolybdenum, per lb., Mo, f.o.b. furnace 95c.
Calcium molybdate, per lb. Mo, f.o.b. furnace 80c.
Molybdenum oxide briquettes 48-52 Mo, per lb. contained Mo, f.o.b. Langeloth, Pa. 80c.
Molybdenum oxide, in cans, per lb. contained Mo, f.o.b. Langeloth, and Washington, Pa. 80c.

*Spot prices are \$5 per ton higher.
†Spot prices are 10c. per lb. of contained element higher.

LAKE SUPERIOR ORES

(51.50% Fe., Delivered Lower Lake Ports)

	Per Gross Ton
Old range, bessemer, 51.50	\$4.75
Old range, non-bessemer, 51.50	4.60
Mesaba, bessemer, 51.50	4.60
Mesaba, non-bessemer, 51.50	4.45
High phosphorus, 51.50	4.35

COKE*

Furnace

Per Net Ton
†Connellsville, prompt\$6.00

Foundry

†Connellsville, prompt\$6.75 to \$7.00
By-product, Chicago\$12.25
By-product, New England\$13.75
By-product, Newark\$12.40 to \$12.95
By-product, Philadelphia\$12.38
By-product, Cleveland\$12.30
By-product, Cincinnati\$11.75
By-product, Birmingham\$8.50†
By-product, St. Louis\$12.02
By-product, Buffalo\$12.50

*Maximum by-product coke prices established by OPA became effective Oct. 1, 1941. A complete schedule of the ceiling prices was published in THE IRON AGE, Sept. 25, 1941, p. 94B. Maximum beehive furnace coke prices established by OPA, Jan. 26, †F.O.B. oven. Ceiling for operators of hand drawn ovens using trucked coal is \$6.50.

FLUORSPAR

Per Net Ton
Domestic washed gravel, 85-5 f.o.b. Kentucky and Illinois mines, all rail\$25.00
Domestic, f.o.b. Ohio River landing barges 25.00
No. 2 lump, 85-5 f.o.b. Kentucky and Illinois mines 25.00

REFRACTORIES

(F.o.b. Works)

Fire Clay Brick

Per 1000
Super-duty brick, St. Louis\$64.60
First quality, Penna., Md., Ky., Mo. & Ill. 51.30
First quality, New Jersey 56.00
Second quality, Penna., Md., Ky., Mo. & Ill. 46.55
Second quality, New Jersey 51.00
No. 1, Ohio 43.00
Ground fire clay, net ton 7.60

Silica Brick

Pennsylvania & Birmingham\$51.30
Chicago District 58.90
Silica cement, net ton (Eastern) .. 9.00

Chrome Brick

Per Net Ton
Standard or chemically bonded, Balt., Plymouth Meeting and Chester\$54.00

Magnesite Brick

Standard, Balt. and Chester\$76.00
Chemically bonded, Baltimore 65.00

Grain Magnesite

Domestic, f.o.b. Balt. and Chester in sacks (carloads)\$44.00
Domestic, f.o.b. Chewelah, Wash. (in bulk) 23.00